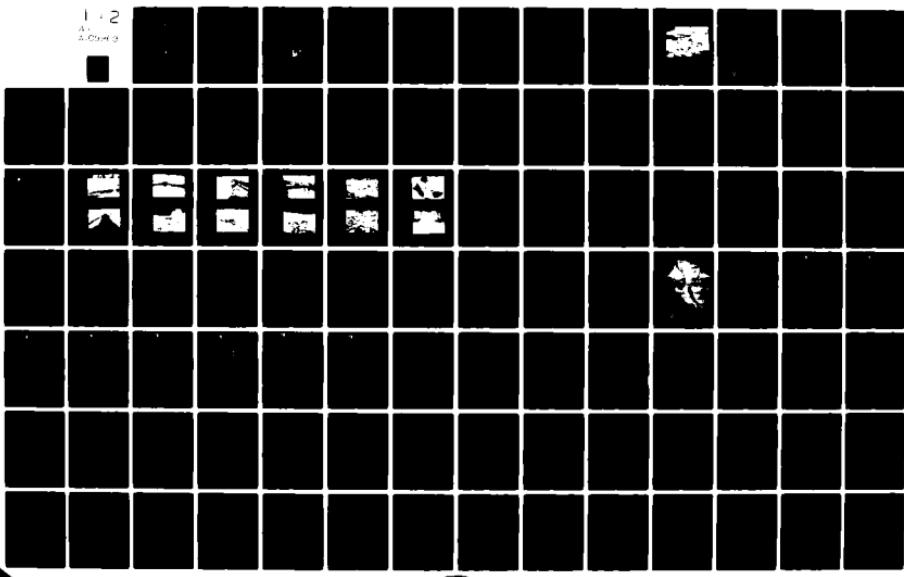


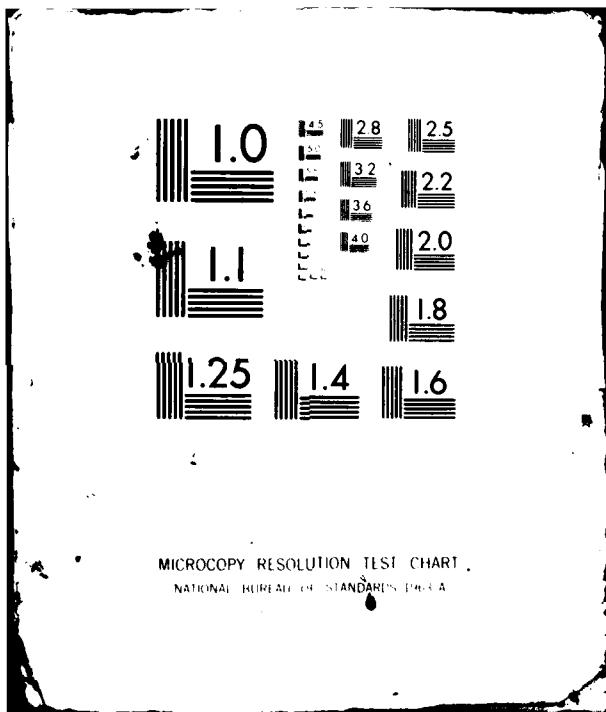
AD-A109 969 FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT
NATIONAL DAM SAFETY PROGRAM. LAKE MUSKODAY DAM (INVENTORY NUMBER--ETC(U)
SEP 81 H C FLAHERTY DACW51-81-C-0006

F/G 13/13
NL

UNCLASSIFIED

1 + 2
A
A-CHE-3





SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
AD-A309969		
4. TITLE (and Subtitle) Phase I Inspection Report Lake Muskoday Dam Delaware River Basin, Sullivan County, NY Inventory No. NY00341	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program	
7. AUTHOR(s) Hugh C. Flaherty	6. PERFORMING ORG. REPORT NUMBER DIA	
8. CONTRACT OR GRANT NUMBER(s) DACW-51-81-C-0006	9. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS	
10. PERFORMING ORGANIZATION NAME AND ADDRESS Flaherty-Giauara Associates One Columbus Plaza New Haven, CT 06510	11. REPORT DATE 14 September 1981	
11. CONTROLLING OFFICE NAME AND ADDRESS New York State Department of Environmental Conservation/ 50 Wolf Road Albany, New York 12233	12. NUMBER OF PAGES 1	
13. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) Department of the Army 26 Federal Plaza/New York District, CofE New York, N.Y. 10278	14. SECURITY CLASS. (of this report) UNCLASSIFIED	
15. DECLASSIFICATION/DOWNGRADING SCHEDULE	16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; Distribution unlimited.	
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) Original document color plates: All DDCR reproductions will be in black and white.		
18. SUPPLEMENTARY NOTES JAN 25 1982 S H		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Dam Safety National Dam Safety Program Visual Inspection Hydrology, Structural Stability Lake Muskoday Dam Sullivan County, N.Y. Delaware River Basin		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization. Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied.		

FILE COPY

DD FORM 1 JAN 73 1473

EDITION OF 1 NOV 65 IS OBSOLETE

412599

UNCLASSIFIED 01 21 82 147
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by all storms exceeding 11 percent of the Probable Maximum Flood (PMF). Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

The classification "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to life downstream of the dam.

DELAWARE RIVER BASIN

LAKE MUSKODAY DAM

**SULLIVAN COUNTY, NEW YORK
INVENTORY No. NY 341**

**PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM**



**APPROVED FOR PUBLIC RELEASE;
DISTRIBUTION UNLIMITED**

**NEW YORK DISTRICT, CORPS OF ENGINEERS
JULY 1981**

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

H 23

Accession No.	THIS IS A COPIE OF THE ORIGINAL
Spillway	Spillway
Dist.	Dist.
Area	Area
W.M.	W.M.
Inspection	Inspection
Report	Report
Signature	Signature
Date	Date
Comments	Comments

ORIC COPIES
INSPL

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
LAKE MUSKODAY DAM
INVENTORY NO. NY 341
DELAWARE RIVER BASIN
SULLIVAN COUNTY, NEW YORK

TABLE OF CONTENTS

	<u>PAGE NO.</u>
ASSESSMENT	-
OVERVIEW PHOTOGRAPH	-
LOCATION MAP	i
1 - PROJECT INFORMATION	1
1.1 GENERAL	1
1.2 DESCRIPTION OF PROJECT	1
1.3 PERTINENT DATA	3
2 - ENGINEERING DATA	5
2.1 GEOTECHNICAL DATA	5
2.2 DESIGN RECORDS	5
2.3 CONSTRUCTION RECORDS	5
2.4 OPERATION RECORDS	6
2.5 EVALUATION OF DATA	6
3 - VISUAL INSPECTION	7
3.1 FINDINGS	7
3.2 EVALUATION OF OBSERVATIONS	8
4 - OPERATION AND MAINTENANCE PROCEDURES	9
4.1 PROCEDURE	9
4.2 MAINTENANCE OF DAM	9
4.3 WARNING SYSTEM	9
4.4 EVALUATION	9

5 - HYDROLOGIC/HYDRAULIC	10
5.1 DRAINAGE AREA CHARACTERISTICS	10
5.2 ANALYSIS CRITERIA	10
5.3 SPILLWAY CAPACITY	11
5.4 RESERVOIR CAPACITY	11
5.5 FLOODS OF RECORD	11
5.6 OVERTOPPING POTENTIAL	11
5.7 EVALUATION	12
6 - STRUCTURAL STABILITY	13
6.1 EVALUATION OF STRUCTURAL STABILITY	13
7 - ASSESSMENT/RECOMMENDATIONS	14
7.1 ASSESSMENT	14
7.2 RECOMMENDED MEASURES	15

APPENDICES

- A. PHOTOGRAPHS
- B. VISUAL INSPECTION CHECKLIST
- C. HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS
- D. PREVIOUS INSPECTION REPORTS/AVAILABLE DOCUMENTS
- E. STRUCTURAL STABILITY ANALYSIS
- F. REFERENCES
- G. DRAWINGS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam: Lake Muskoday Dam
State Located: New York
County: Sullivan
Watershed: Delaware River Basin
Watercourse: Trout Brook
Date of Inspection: April 8, 1981

ASSESSMENT

Examination of available documents and a visual inspection of the dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies that need to be evaluated and remedied.

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the embankment would be overtopped by all storms exceeding 11 percent of the Probable Maximum Flood (PMF). Dam overtopping, the resulting erosion of the embankment and hence, dam breaching would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

The classification "unsafe" applied to a dam because of a seriously inadequate spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean that there appears to be a serious deficiency in spillway capacity and if a severe storm were to occur, overtopping and failure of the dam could take place, significantly increasing the hazard to life downstream of the dam.

It is recommended that the following additional investigations be performed by a registered professional engineer engaged by the owner:

1. Conduct a detailed hydrologic and hydraulic analysis to more accurately determine the site specific characteristics of the watershed.

2. Investigate the water flow that was evident in the downstream rockfill on either side of the spillway, including observation when lake levels vary, and determine the source of the flow, evaluate the potential for dam instability or failure and recommend remedial measures, if appropriate.

It is recommended that within 3 months of the final approval date of this report, both additional investigations should be initiated and within 18 months, appropriate remedial measures should be completed. In the interim, a plan for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented.

The following remedial measures should be completed within 12 months to correct existing deficiencies:

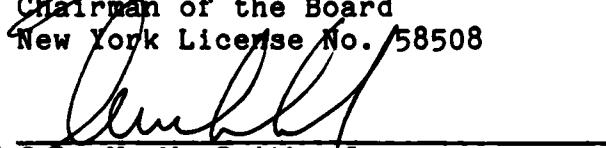
1. Clear brush, trees and debris from the downstream rockfill, and recut at least annually to maintain the cleared condition.
2. Fill and regrade the local potholes on the dam crest, and grade the roadway and its side ditches to avoid detrimental erosion at the dam.
3. Place rockfill or riprap erosion protection where the upstream earthen embankment has been eroded by wave action.
4. Develop and implement a flood warning and emergency evacuation plan to alert downstream residents in the event conditions occur which could result in failure of the dam.
5. A program for regular maintenance should be developed and implemented.

Submitted by:

FLAHERTY GIAVARA ASSOCIATES, P.C.


Hugh C. Flaherty, P.E. & L.S.
Chairman of the Board
New York License No. 58508

Approved by:

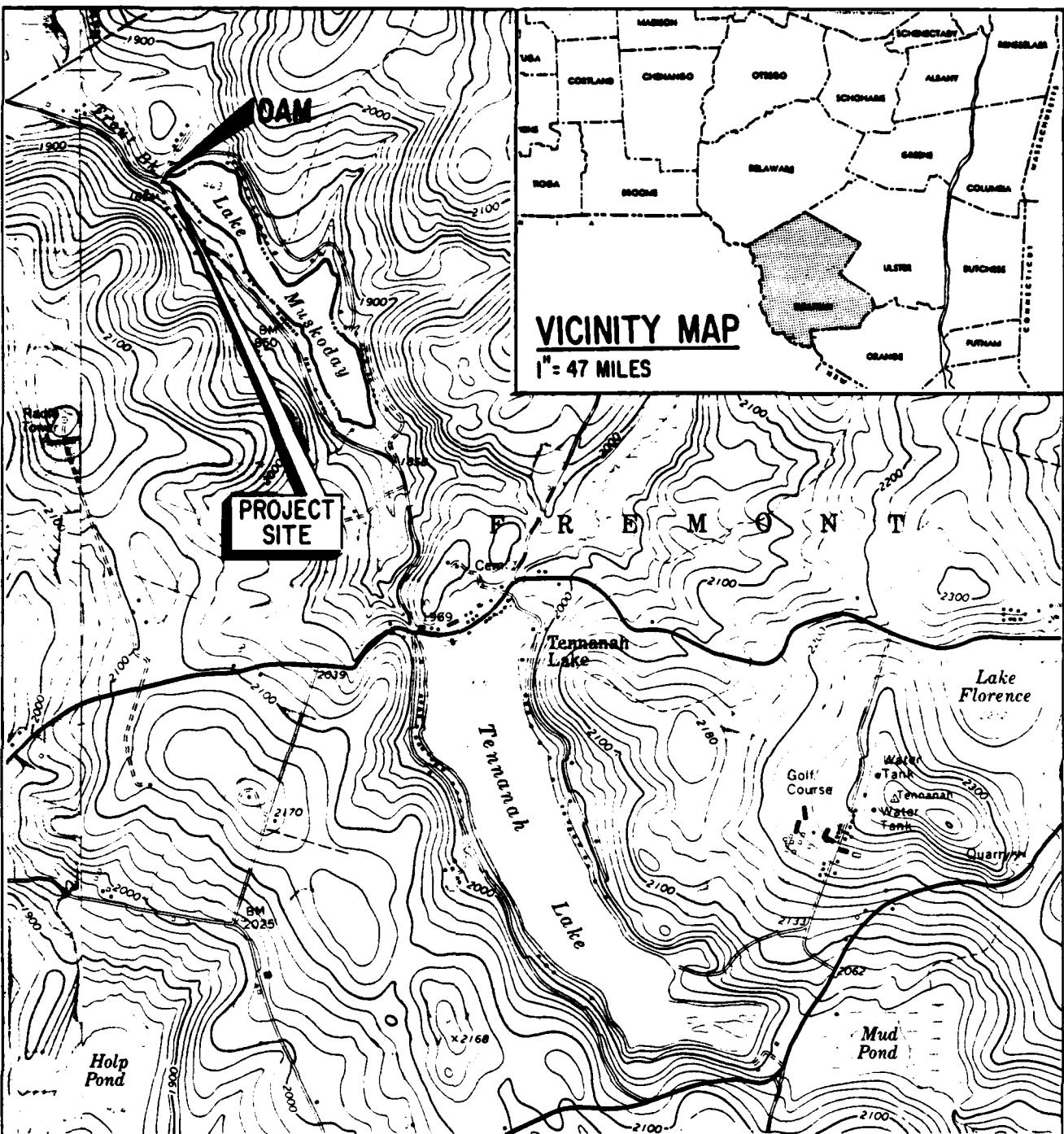

Col. W. M. Smith, Jr.
New York District Engineer

Date:

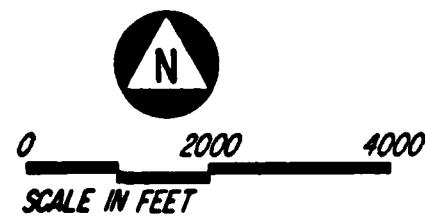
14 Sep 81



PHOTO #1: Overview of
Lake Muskoday Dam
Inventory No. NY 341



LOCATION MAP



Lake Muskoday Dam
INVENTORY No. NY 341
DELAWARE RIVER BASIN
SULLIVAN COUNTY
FREMONT, NEW YORK

FLAHERTY • GIAVARA ASSOCIATES, P.C.

NATIONAL DAM SAFETY PROGRAM
PHASE I INSPECTION REPORT
LAKE MUSKODAY DAM
INVENTORY NO. NY 341
D.E.C. NO. 147A-413
DELAWARE RIVER BASIN
SULLIVAN COUNTY, NEW YORK

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I Inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers, to fulfill the requirements of the National Dam Inspection Act, Public Law 92-367. Flaherty Giavara Associates, P.C. has been retained by the New York District to inspect and report on selected dams in the State of New York. Authorization and notice to proceed was issued to Flaherty Giavara Associates, P.C. under a letter of December 24, 1980 from W. M. Smith Jr., Colonel, Corps of Engineers. Contract No. DACW 51-81-C-0006 has been assigned by the Corps of Engineers for this work.

b. Purpose

Evaluation of the existing conditions of the subject dam to identify deficiencies and hazardous conditions, determine if they constitute hazards to life and property and recommend remedial measures where necessary.

1.2 DESCRIPTION OF PROJECT

a. Description of Dam and Appurtenances

Lake Muskoday Dam consists of a stone masonry and stone fill structure with an upstream concrete wall and a concrete overflow spillway in the central portion. The 20 foot wide crest of the dam and a timber deck over the spillway carry a private access road to lakefront property. The total length of the dam is approximately 155 feet, including the 17.4 wide spillway section. A sketch plan and sections prepared by Sheldon Hadden, P.E. are shown on page D-9 in Appendix D.

The dam structure is approximately 17 feet high; it has an irregular upstream earthen slope below the projecting concrete wall and irregular downstream rockfill that has a slope in the range from 2 to 3 horizontal to 1 vertical. An old inspection report indicates that the up-

stream concrete wall extends 3 to 6 feet below the original ground surface to "hard pan" to form a cutoff.

The overflow spillway is 17.4 feet wide and is located in the center of the embankment. It has concrete abutments and wingwalls with a rockfill apron and a timber and steel bridge spans its width.

b. Location

Lake Muskoday Dam is located approximately 4.3 miles southwest of the village of Roscoe in the Town of Fremont, New York. The dam is located at latitude north $41^{\circ}54.8'$ and longitude west $74^{\circ}59.7'$ on the U.S. Geological Survey 7.5 minute series topographic map "Roscoe, New York". The Location Map on page i indicates where the dam is situated.

c. Size Classification

The maximum height of the dam is 17 feet and the maximum storage capacity is 370 acre-feet at the top of dam. Therefore, Lake Muskoday Dam is classified as a "Small" dam as defined by the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification

There are three roads and approximately 4 dwellings within the dam failure flood hazard area. Therefore, the dam is in the "High" hazard category as defined by the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership

The dam is owned by the Lake Muskoday Bungalow Colony, Inc. The address is as follows:

Owner

Contact: Ms. Dorothy B. Graham, Secretary
Lake Muskoday Bungalow Colony, Inc.
Lake Muskoday
Roscoe, New York 12776

f. Purpose

The primary purpose of this dam is to maintain the water level of the lake for recreational use.

g. Design and Construction History

The dam was constructed in 1925. Some design data is documented in the application for the construction of the dam dated January 22, 1924 which is included in Appendix D. No other design or construction history data was obtained.

The only major post construction modification noted was the addition of riprap and stone masonry to the dam in 1975 and 1976.

h. Normal Operating Procedure

There are no regular operating procedures for this dam. The normal water level in the lake is maintained by the crest elevation of the spillway weir at 1843.0 (NGVD).

1.3 PERTINENT DATA

a. <u>Drainage Area (Square Miles)</u>	4.45
b. <u>Discharge at Dam Site (CFS)</u>	
- Top of Dam	189
- Crest of Overflow Spillway	-
c. <u>Elevations (NGVD - estimated)</u>	
- Top of Dam	1845.6
- Crest of Overflow Spillway	1843.0
- Reservoir Drain (outlet invert)	1839.3+
d. <u>Reservoir Surface Area (Acres)</u>	
- Top of Dam	57
- Crest of Overflow Spillway	50
e. <u>Storage (Acre-Feet)</u>	
- Top of Dam	370
- Crest of Overflow Spillway	240
f. <u>Dam</u>	
- Type: Stone fill between stone masonry and concrete walls and a concrete cutoff with a rockfill downstream slope	
- Length (Feet)	155
- Upstream Slope (H:V)	varies
- Downstream Slope (H:V)	2.0-3.0:1
- Crest Width (Feet)	20

g. Overflow Spillway

- Type: Concrete weir with concrete abutments and a rockfill apron
- Length (Feet) 17.4
- Width (Feet) 20
- Side Slopes (H:V) vertical
- Channel Bottom Slopes (Feet/Foot) -
- Control: None

h. Reservoir Drain

- Type: 24 inch diameter corrugated metal pipe (25 feet long)
- Control: "Stopboards"

SECTION 2 - ENGINEERING DATA

2.1 GEOTECHNICAL DATA

a. Geology

The Lake Muskoday Dam is located on Trout Brook, a north-westerly flowing tributary to the Beaver Kill, about 4.3 miles southwest of the village of Roscoe, a short distance south of the Delaware-Sullivan county line, in the Catskill Mountain subprovince of the Appalachian (Allegheny) Plateau physiographic province of New York State.

The topography in the area ranges from elevation 1840 at the downstream toe of the dam to approximately elevation 2200 at the summits of the hills surrounding the dam and lake area.

The underlying bedrock at the site consists of the Slide Mountain Formation belonging to the Upper Devonian West Falls Group. This formation is the terrestrial deposit of the Catskill Delta and consists of a medium to coarse-grained, red, silty sandstone and conglomerate containing minor amounts of red silty shale. It was derived from a combination of distributary channel, floodplain, and beach deposits.

Above the bedrock, the valley bottom and side slopes are mantled by a heterogeneous mixture of clay, silt, sand and rock fragments known as glacial till, deposited at the base of ice sheets which once covered the region.

b. Subsurface Conditions

There is no record of subsurface explorations at the site of Lake Muskoday Dam; however, the original application for construction of the dam, dated January 22, 1924 and included in Appendix D, refers to "clay on surface with hard pan about 2 ft." down.

2.2 DESIGN RECORDS

Some design information from the original application for the construction of the dam is included in Appendix D. No other design records were obtained.

2.3 CONSTRUCTION RECORDS

This dam was constructed in 1925. A plan, and sections of the dam are included on page D-9 in Appendix D. No other construction records were obtained.

2.4 OPERATION RECORDS

No operation records were obtained for this dam.

2.5 EVALUATION OF DATA

The data presented herein was obtained from the files of the New York State Department of Environmental Conservation (DEC). This information appears to be reliable and adequate for the purposes of a Phase I Inspection Report.

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of the Lake Muskoday Dam was conducted on April 8, 1981. The weather was sunny and the temperature was 60° F. At the time of the inspection, water was flowing in the overflow spillway (See Photos No. 7 and 9).

b. Dam

The masonry and stone fill dam structure is generally in fair condition (See Photos No. 4 and 5). There was no visible evidence of significant lateral movement or settlement, or major erosion, but there was moderate water flow from the rockfill on either side of the spillway.

The following specific items were noted:

1. Water flow estimated at a rate greater than 40 gallons per minute (GPM) was exiting from the rockfill on either side of the spillway 2 to 2.5 feet above the downstream water level (See Photo No. 12). Spillway discharge may have dispersed laterally among the rocks to contribute to this flow, but some appeared to come from the dam structure. While sediment was not evident in the flow, there was some medium to fine sand on the channel bottom where the water velocity slowed.
2. There has been local erosion of the upstream earthen embankment at and slightly above the waterline, apparently due to wave action (See Photo No. 6). Occasional exposed rocks may be partial riprap protection.
3. The partially-paved roadway along the dam crest has local shallow potholes, apparently due to traffic under wet conditions (See Photo No. 3).
4. At either end of the dam, the downstream rockfill slope has weeds and brush, some debris and at least one tree among the rock fragments (See Photos No. 10 and 11).
5. The swale between the downstream slope and the right abutment has undergone some erosion where the roadside ditch drains into the stream.

c. Overflow Spillway

The overflow spillway consists of a 17.4 foot wide broad-crested weir and rockfill apron (See Photos No. 8 and 9). A timber plank and steel beam bridge spans the weir, which was free of debris and in good condition at the time of inspection.

d. Downstream Channel

The natural channel downstream from the dam has a width of 25+ feet (See Photo No. 13). The stream contains riffles and pools with bed material ranging in gradation from fine to coarse gravel with some cobbles. Immediately downstream of the dam, the bank stability is good and there are no channel obstructions.

e. Reservoir - Storage Pool Area

The lake shoreline is generally wooded or developed with cabins; it ranges from gently to steep sloping, but the steeper portions are rock-controlled and there is no significant possibility of landslides into the lake affecting the safety of the dam.

3.2 EVALUATION OF OBSERVATIONS

The visual inspection revealed several deficiencies on this structure. The following observations were made:

- a.(1) Water flow estimated at greater than 40 GPM was exiting from the rockfill on either side of the overflow spillway;
- b.(2) At and slightly above the waterline, there was local erosion of the upstream embankment;
- c.(3) The partially-paved roadway along the dam crest has local, shallow potholes;
- d. - At both ends of the dam, the downstream rockfill slope has weeds, brush, some debris and at least one tree among the rock fragments,
- e. 5 The swale between the downstream slope and the right abutment has undergone some erosion.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

The normal water surface level is maintained by the crest of the spillway weir at elevation 1843.0 (NGVD). No operational procedures are in effect at this time.

4.2 MAINTENANCE OF DAM

There was no evidence of any routine maintenance operations directed toward the Lake Muskoday Dam structure; however, the roadway and the upstream grassed areas do appear to be maintained. In addition, a September, 1975 letter to the State indicates that the downstream rockfill may have been placed in 1975 or 1976 to reinforce the dam.

4.3 WARNING SYSTEM

No warning system is presently in effect.

4.4 EVALUATION

Presently, no operation or maintenance procedures are in effect for this dam. Therefore, a program of regular operation and maintenance procedures should be implemented.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The dam is located in the Town of Fremont on Trout Brook, approximately 7.9 miles upstream of the Beaver Kill. The Beaver Kill joins the Delaware River near the village of Hancock, approximately sixty-nine miles upstream of Port Jervis, New York.

The watershed (shown on the Watershed Map on Page C-5 in Appendix C) consists of 2,847 acres (4.45 square miles) of rolling to hilly uplands with typical slopes of 10 percent. Land within the watershed is primarily undeveloped with extensive woodlands. Tennenah Lake, which has a surface area of 166 acres (0.26 square miles), is located within the watershed $1.5\pm$ miles upstream of Lake Muskoday Dam. The only other major upstream storage area is a swamp which has an area of approximately 35 acres and is situated on a tributary to Tennenah Lake.

The watercourse upon which the reservoir is located, is a perennial stream with a typical flow width of 25 feet and a typical flow depth of 8 inches.

5.2 ANALYSIS CRITERIA

The purpose of the hydrologic/hydraulic analysis is to evaluate the spillway capacity and the potential for overtopping. The analysis of the spillway capacity of the dam and storage of the reservoir was performed using the Corps of Engineers' HEC-1 Computer Model - Dam Safety Version. The procedure included determining the Probable Maximum Flood (PMF) runoff from the watershed and routing the inflow hydrograph through the impoundment to determine the outflow hydrograph. The unit hydrograph was defined by the Snyder Synthetic Unit Hydrograph method, and the Modified Puls routing procedure was incorporated.

The initial rainfall loss was assumed to be 1.0 inches, and the uniform rainfall loss was assumed to be 0.1 inches per hour. In accordance with recommended guidelines of the Corps of Engineers, the Probable Maximum Precipitation (PMP) was 20.7 inches (24 hour duration, 200 square mile area).

The analysis was conducted for both the full PMF and for several fractional PMF conditions. The PMF inflow of 5,138 CFS was routed through the reservoir and the peak outflow was determined to be 4,687 CFS.

5.3 SPILLWAY CAPACITY

The total outlet capacity is the discharge from the overflow spillway.

The overflow spillway consists of a 17.4 foot wide broad-crested concrete weir and a rockfill apron. The weir is divided into two sections, one 8.5 feet wide and the other 8.9 feet wide, which are separated by a concrete pier for the bridge.

The stage discharge data for the overflow spillway capacity was calculated for the stages tabulated below:

<u>Stage (Feet)</u>	<u>Discharge Capacity (CFS)</u>	<u>Element of Structure</u>
1843.0	0	Overflow Spillway Crest
1843.5	19	--
1844.0	52	--
1844.5	96	--
1844.7	116	Bottom of Bridge
1844.8	132	--
1845.2	166	--
1845.6	189	Top of Dam

The total spillway capacity at the top of dam is 189 CFS.

5.4 RESERVOIR CAPACITY

The storage capacity of the lake was obtained from the application for the reconstruction of the dam dated May 21, 1937 for the stages indicated below:

<u>Stage (Feet)</u>	<u>Storage (Acre-Feet)</u>	<u>Storage (Inches of Runoff)</u>
1843.0	240	1.01
1845.6	370	1.56

5.5 FLOODS OF RECORD

No data regarding flood levels was obtained for this dam.

5.6 OVERTOPPING POTENTIAL

The results of the HEC-1 DB computer analysis indicate that the crest of the dam is overtopped by all storms exceeding 11 percent of the PMF event. The PMF discharge rate of 4,687 cubic feet per second (CFS) would occur at a peak flood stage of 1850.9 feet, which is 5.3 feet above the crest of the dam.

The results of the analysis are tabulated below:

<u>Flood Condition</u>	<u>Peak Inflow (CFS)</u>	<u>Peak Outflow (CFS)</u>	<u>Maximum Stage Elevation (NGVD)</u>
0.5 PMF	2566	2242	1848.7
1.0 PMF	5138	4687	1850.9

5.7 EVALUATION

Using the Corps of Engineers' screening criteria for the initial review of spillway adequacy, it has been determined that the capacity of the overflow spillway is not adequate to pass either the full PMF or one half the PMF; only approximately 11 percent of the outflow from the PMF can be safely passed before overtopping will occur. The PMF event would overtop the dam for a duration of 22.5 hours and the maximum depth of flow over the crest would be 5.3 feet. It is estimated that breaching of the dam as a result of overtopping, would cause water surface levels downstream to reach depths which would pose significant danger to residents. Therefore, the spillway is adjudged to be seriously inadequate and the dam is assessed as unsafe, nonemergency.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observations

There was no visible evidence of major settlement or lateral movement of the upstream concrete wall, or overall structural instability of the dam during the site examination. The flow from beneath the downstream rockfill on either side of the overflow spillway is not an immediate reason to question the static structural stability of the dam, but it could adversely affect stability if there is active erosion of foundation soil.

b. Design and Construction Data

The 1924 and 1975 sketches of Lake Muskoday Dam included in Appendix D, show a configuration for the dam and overflow spillway that generally corresponds to the conditions observed during the visual examination on April 8, 1981.

There is no construction data to confirm the actual physical properties and configuration of the stone fill in the dam structure. However, the dam proportions including the downstream rockfill are considered to be reasonable for the height of the structure and therefore, the dam would be expected to have adequate safety margins with respect to stability under static loading conditions.

c. Operating Records

No operating records were obtained for Lake Muskoday Dam.

d. Post Construction Changes

The only major post construction modification noted was the addition of riprap and stone masonry to the dam in 1975 and 1976.

e. Seismic Stability

The Lake Muskoday Dam is located in Seismic Zone 1 and in accordance with recommended Phase I guidelines does not require seismic analysis.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Condition

On the basis of the visual examination, there were no signs of impending structural failure or other conditions which would warrant urgent remedial action; however, the apparent seepage flow is a significant deficiency which should have further investigation.

b. Adequacy of Information

The evaluation of this dam is based primarily on visual examination, reference to the 1924 and 1975 sketches, approximate hydraulic and hydrologic computations, and application of engineering judgement. The available information that was obtained is adequate for the purposes of a Phase I assessment.

c. Need for Additional Investigations

It is recommended that the following additional investigations be performed by a registered professional engineer engaged by the owner:

1. Conduct a detailed hydrologic and hydraulic analysis to more accurately determine the site specific characteristics of the watershed.
2. Investigate the water flow that was evident in the downstream rockfill on either side of the spillway, including observation when lake levels vary, and determine the source of the flow, evaluate the potential for dam instability or failure and recommend remedial measures, if appropriate.

d. Urgency

It is recommended that within 3 months of the final approval date of this report, both additional investigations should be initiated and within 18 months, appropriate remedial measures should be completed. In the interim, a plan for providing around-the-clock surveillance of the dam during periods of unusually heavy precipitation should be developed and implemented. The recommended corrective measures presented in Section 7.2 should be completed within 12 months of final approval.

7.2 RECOMMENDED MEASURES

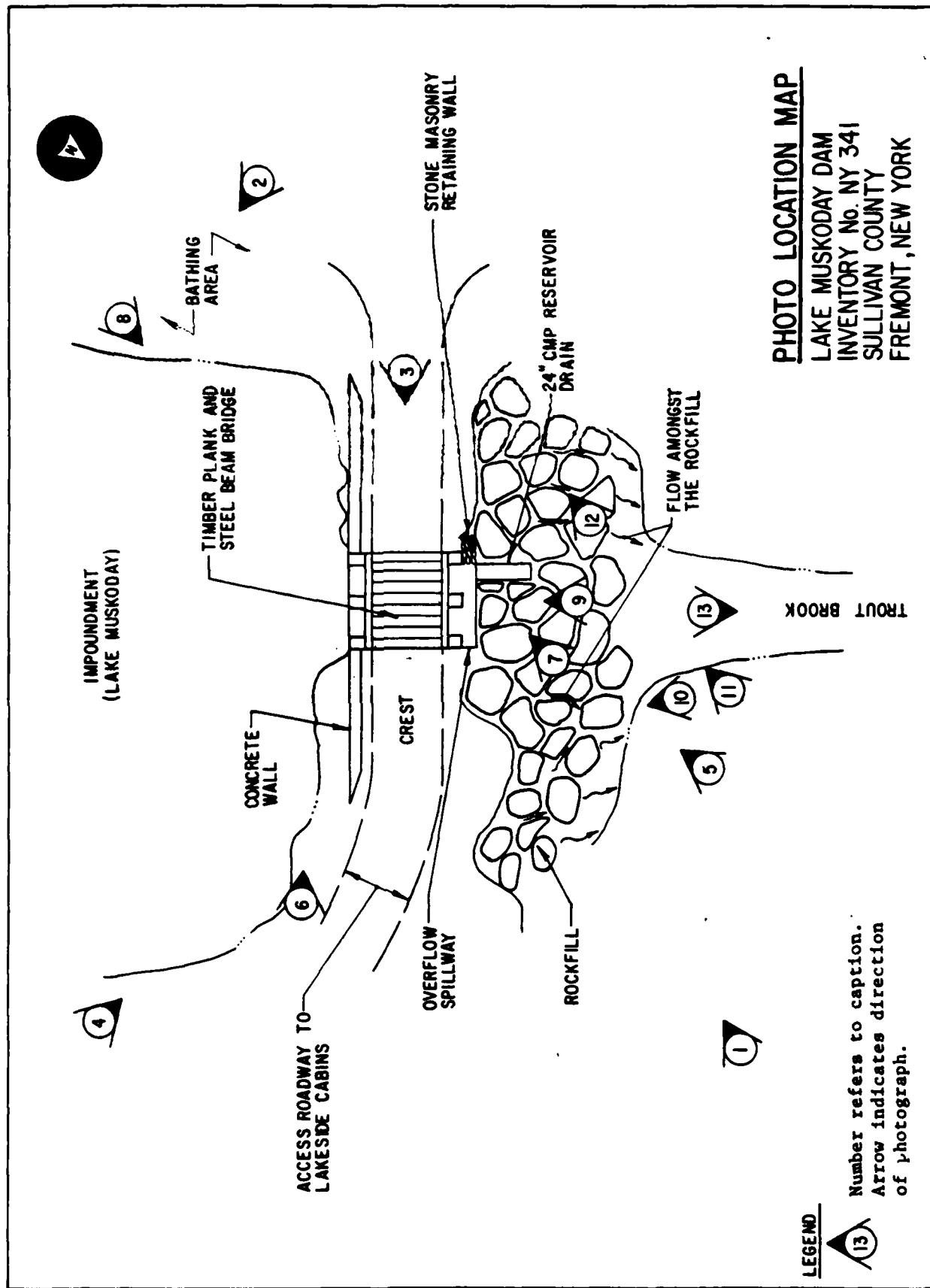
It is considered important that the following items be accomplished in addition to any items required as a result of the additional investigations recommended in Section 7.1c:

- a. Clear brush, trees and debris from the downstream rockfill, and recut at least annually to maintain the cleared condition.
- b. Fill and regrade the local potholes on the dam crest, and grade the roadway and its side ditches to avoid detrimental erosion at the dam.
- c. Place rockfill or riprap erosion protection where the upstream earthen embankment has been eroded by wave action.
- d. Develop and implement a flood warning and emergency evacuation plan to alert downstream residents in the event conditions occur which could result in failure of the dam.
- e. A program for regular maintenance should be developed and implemented.

APPENDIX A
PHOTOGRAPHS

PHOTO LOCATION MAP

**LAKE MUSKODAY DAM
INVENTORY No. NY 341
SULLIVAN COUNTY
FREMONT, NEW YORK**



LEGEND

Number refers to caption.
Arrow indicates direction
of photograph.

A-1



PHOTO #2: Overview of beach area and impoundment

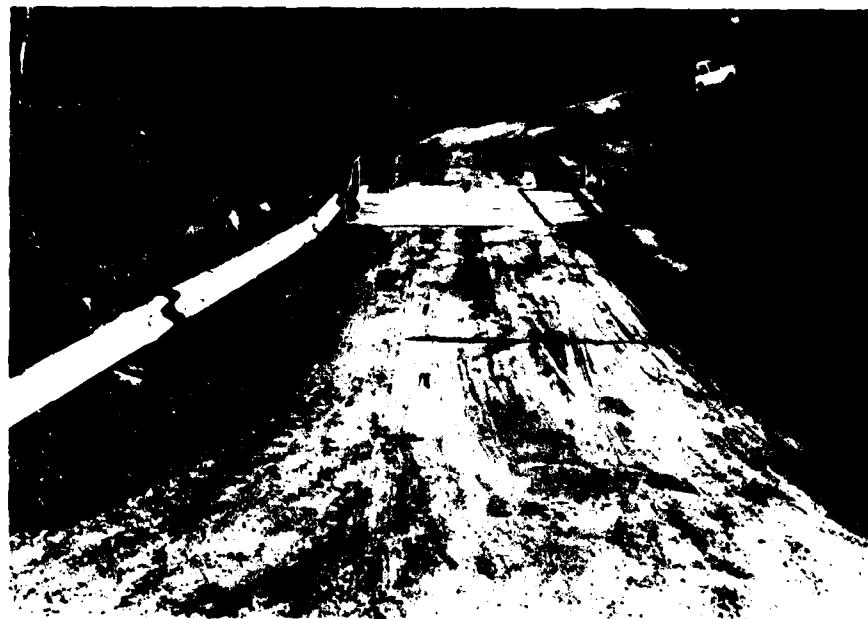


PHOTO #3: Crest of dam looking toward right abutment

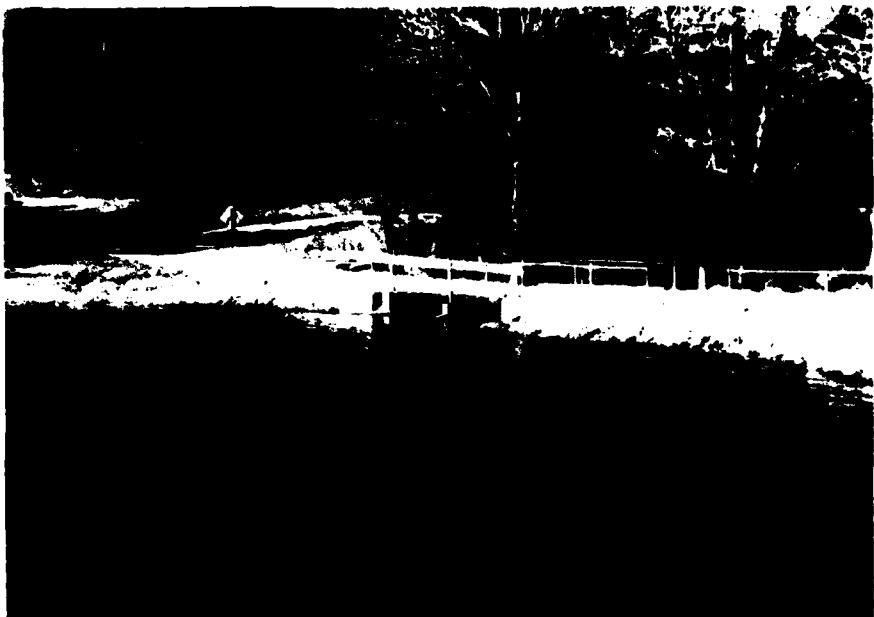


PHOTO #4: Overview of upstream face of dam



PHOTO #5: Overview of downstream face of dam

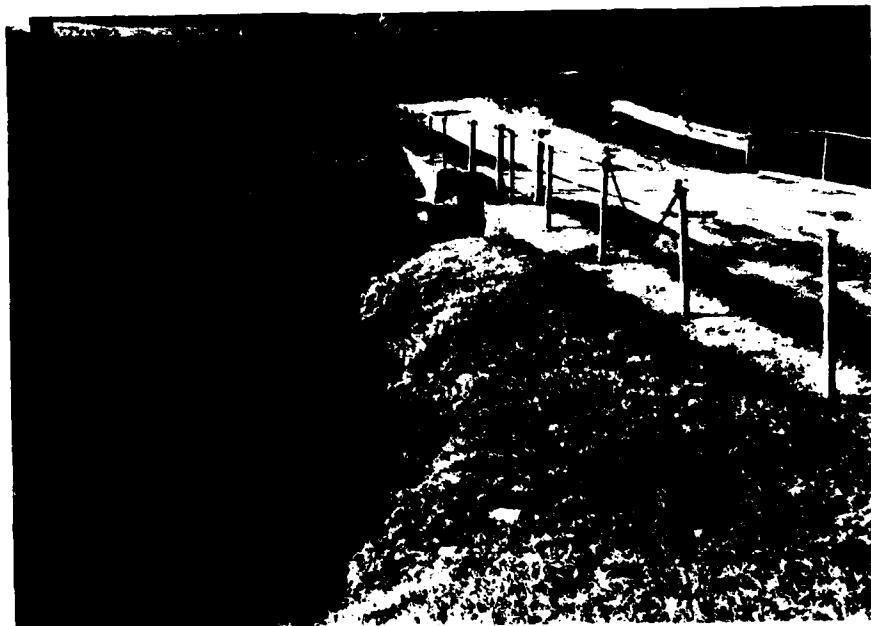


PHOTO #6: Upstream face of dam



PHOTO #7: Downstream face of dam

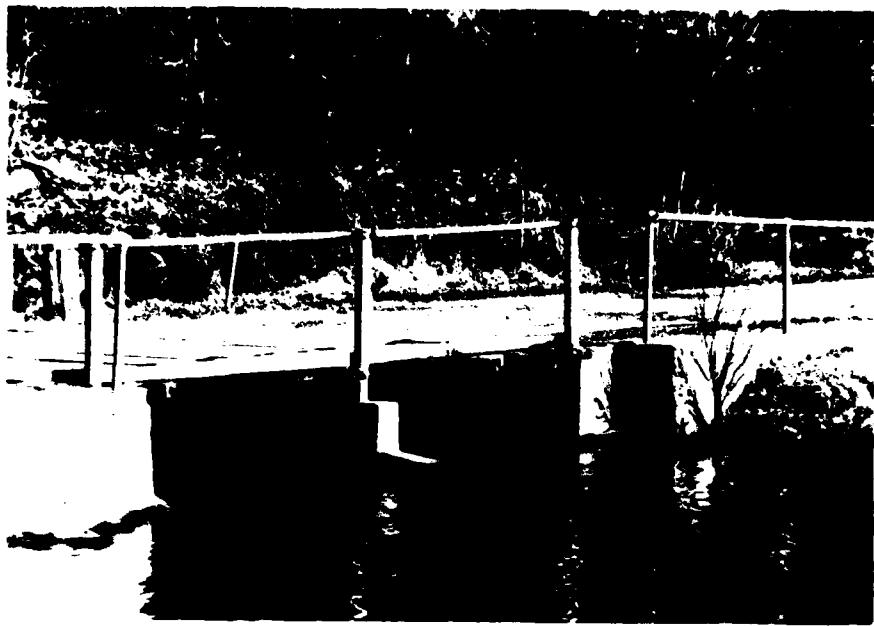


PHOTO #8: Spillway from upstream



PHOTO #9: Spillway from downstream



PHOTO #10: Rockfill on downstream slope at
right abutment



PHOTO #11: Rockfill on downstream slope at
left abutment



PHOTO #12: Water flowing from under rockfill at left abutment



PHOTO #13: Downstream channel conditions

APPENDIX B
VISUAL INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST

1) Basic Data

a. General

Name of Dam Lake Muskoday Dam
Fed. I.D. # NY 341 DEC Dam No. 147A-413
River Basin Delaware
Location: Town Fremont County Sullivan
Stream Name Trout Brook
Tributary of Beaver Kill
Latitude (N) 41° - 54.8' Longitude (W) 74° - 59.7'
Type of Dam Stone fill between concrete and stone masonry walls with a concrete overflow spillway
Hazard Category High
Date(s) of Inspection April 8, 1981
Weather Conditions Sunny, 60° ± F.
Reservoir Level at Time of Inspection Elevation 1483.1 ± (NGVD)

b. Inspection Personnel T.L.Ward & R.A. Criscuolo of Flaherty Giavara Associates, P.C.; P. L. LeCount of Haley & Aldrich, Inc.; B. McL. Whittingham of Salmon Associates

c. Persons Contacted (Including Address & Phone No.)

None

d. History:

Date Constructed 1925 Date(s) Reconstructed Never

Designer Unknown
Constructed By Unknown
Owner Lake Muskoday Bungalow Colony, Inc.

2) Embankment

a. Characteristics

- (1) Embankment Material Stone fill between stone masonry and concrete walls
- (2) Cutoff Type Concrete wall extends to "hardpan"
- (3) Impervious Core Upstream concrete wall
- (4) Internal Drainage System None observed
- (5) Miscellaneous No comments

b. Crest

- (1) Vertical Alignment Good; except for local small depressions (potholes)
- (2) Horizontal Alignment Good; substantially straight
- (3) Surface Cracks None observed
- (4) Miscellaneous Small depressions (potholes) apparently from traffic during wet conditions; grass at edge of road

c. Upstream Slope

- (1) Slope (Estimate - V:H) Irregular
- (2) Undesirable Growth or Debris, Animal Burrows Grass above and below embedded concrete wall; no animal burrows were noted
- (3) Sloughing, Subsidence or Depressions Grass is undercut by wave action at edge of water

(4) Slope Protection Occasional rock at water's edge, may be result
of erosion

(5) Surface Cracks or Movement at Toe None evident

d. Downstream Slope

(1) Slope (Estimate - V:H) 1:2 to 1:3

(2) Undesirable Growth or Debris, Animal Burrows Brush, grass and weeds among
large rock fragments and some debris

(3) Sloughing, Subsidence or Depressions Erosion below right abutment where
roadway ditch drains down to stream

(4) Surface Cracks or Movement at Toe None apparent; although rock slabs below
right abutment may have been displaced

(5) Seepage Moderate flow through rockfill on either side of spillway (estimated
at 40 GPM for each side); no obvious sediment in flow, but some medium to
fine sand on bottom where velocity decreases

(6) External Drainage System (Ditches, Trenches, Blanket) None observed

(7) Condition Around Outlet Structure Rockfill slope and apron

(8) Seepage Beyond Toe None evident

e. Abutments - Embankment Contact

Left: good condition

Right: good condition

(1) Erosion at Contact Described in 2)d. (3)

(2) Seepage Along Contact None obvious; however, seepage through rockfill
described in 2)d.(5) may also be along abutment contacts

3) Drainage System

a. Description of System Broad-crested concrete weir and rockfill discharge slope
and apron leading to the natural streambed

b. Condition of System Good

c. Discharge from Drainage System Rockfill discharge slope dropping approximately
10 feet from weir to streambed

4) Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Peizometers, Etc.)

None observed

5) Reservoir

a. Slopes Rock-controlled steep slopes to gentle, wooded slopes and
lakeside cabins border the impoundment

b. Sedimentation Possible accumulation of sediment behind the dam

c. Unusual Conditions Which Affect Dam None noted

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) Approximately 4 dwellings,
and three roads are within the dam failure flood hazard area

b. Seepage, Unusual Growth None observed

c. Evidence of Movement Beyond Toe of Dam None evident

d. Condition of Downstream Channel Good; fine to coarse gravel streambed material
with some cobbles; no obstructions

7) Spillway(s) (Including Discharge Conveyance Channel)

Overflow spillway and discharge channel

a. General Overflow spillway and discharge channel handle all flows

b. Condition of Overflow Spillway Good; no signs of deterioration

c. Condition of Emergency Spillway Not applicable

d. Condition of Discharge Conveyance Channel Good condition, presently stable

8) Reservoir Drain/Outlet

Type: Pipe X Conduit _____ Other _____

Material: Concrete _____ Metal _____ Corrugated Metal _____ Other _____

Size: 24 inch Length 25 feet

Invert Elevations: Entrance Submerged Exit 1839.3+ (NGVD)

Physical Condition (Describe): Unobservable

Material: Good

Joints: Unknown Alignment Good, for visible section

Structural Integrity: Appears to be good

Hydraulic Capability: Appears to be good

Means of Control: Gate "Stop boards" Valve _____ Uncontrolled _____

Operation: Operable _____ Inoperable _____ Uncontrolled _____

Present Condition (Describe): Good; however, the "stop boards" were not removed during the inspection

9) Structural

- a. Concrete Surfaces Concrete of the overflow spillway is in good condition with only very minor spalling
- b. Structural Cracking No evidence of any structural cracks
- c. Movement - Horizontal & Vertical Alignment (Settlement) None apparent
- d. Junctions with Abutments or Embankments Good condition; one-eighth inch vertical separation at northeast corner
- e. Drains - Foundation, Joint, Face None evident
- f. Water Passages, Conduits, Sluices Good condition
- g. Seepage or Leakage Described in 2) d. (5)

h. Joints - Construction, etc. Good condition; but slight mismatch (gap)

between parapet and left end of spillway deck

i. Foundation Inaccessible

j. Abutments See 9) d. above

k. Control Gates None observed

l. Approach & Outlet Channels Not applicable

m. Energy Dissipators (Plunge Pool, etc.) Overflow spillway discharges
to rockfill slope and apron

n. Intake Structures Not applicable

o. Stability Appears to be stable

p. Miscellaneous No comments

10) Appurtenant Structures (Power House, Lock, Gatehouse, Other)

a. Description and Condition None observed

SALMON ASSOCIATES • Consulting Engineers

BY (initials) DATE _____

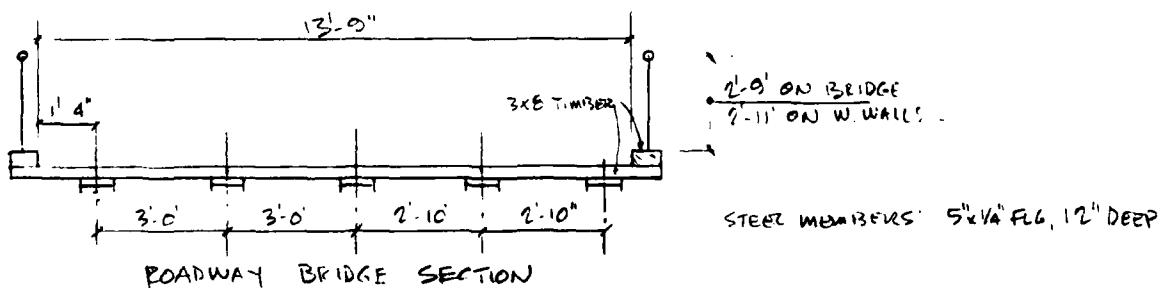
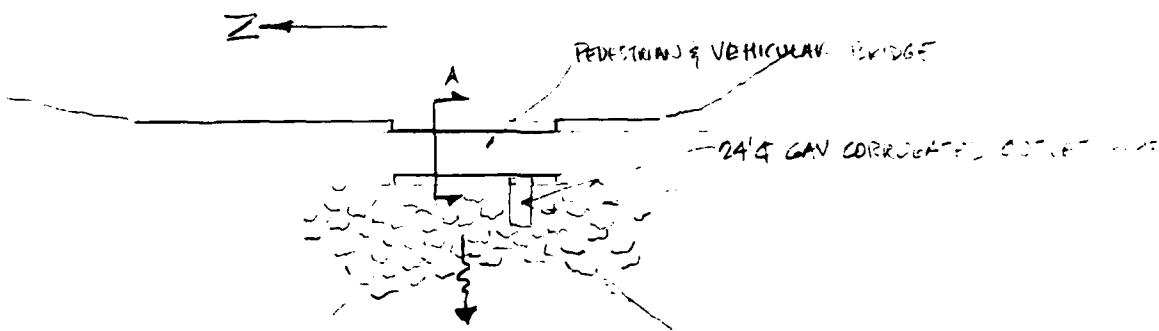
SUBJECT LAWE MUSKOKA LIFT

SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____

JOB NO. 50A1

LAWE MUSKOKA



SALMON ASSOCIATES • Consulting Engineers

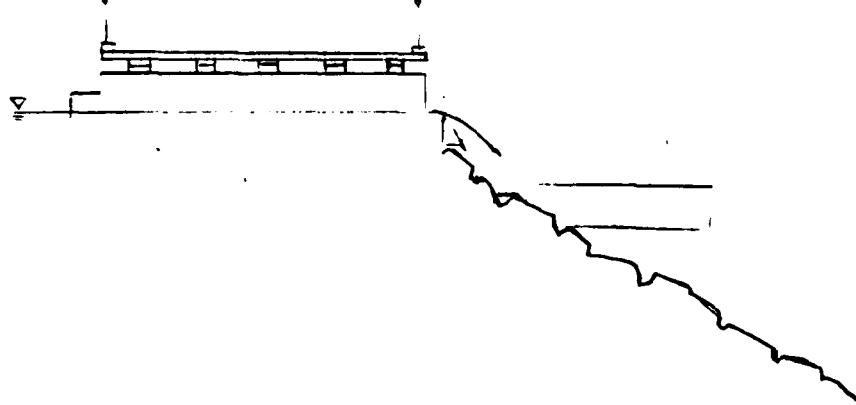
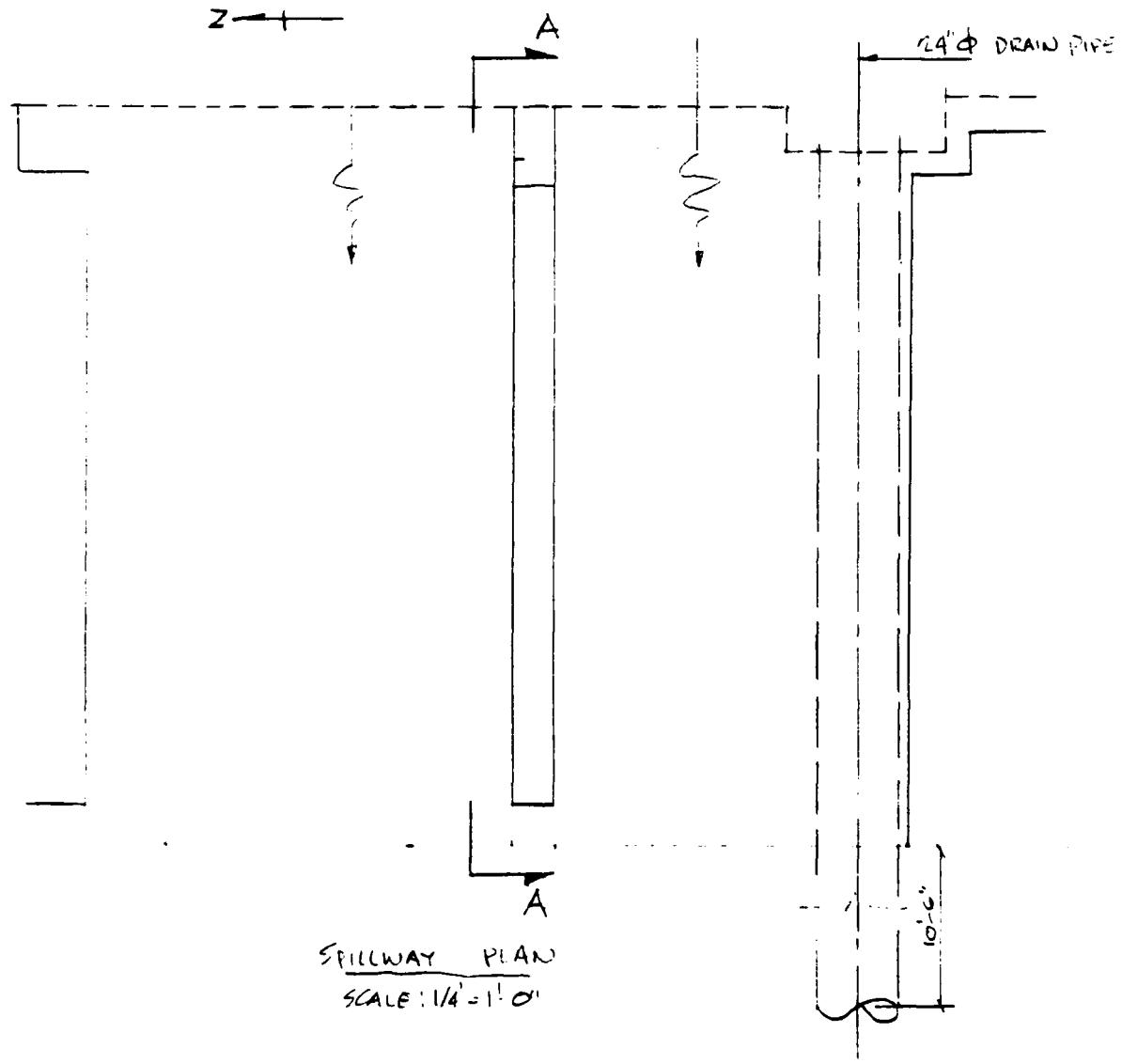
BY T.H. DATE _____

SUBJECT LAKE MUSKOKA D.P.M.

SHEET NO. _____ OF _____

CHKD. BY _____ DATE _____

JOB NO. 214



B-11

APPENDIX C

HYDROLOGIC/HYDRAULIC ENGINEERING DATA AND COMPUTATIONS

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	<u>Elevation</u> (ft.)	<u>Surface Area</u> (acres)	<u>Storage Capacity</u> (acre-ft.)
1) Top of Dam	<u>1845.6</u>	<u>57</u>	<u>370</u>
2) Design High Water (Max. Design Pool)	<u>--</u>	<u>--</u>	<u>--</u>
3) Emergency Spillway Crest	<u>--</u>	<u>--</u>	<u>--</u>
4) Pool Level with Flashboards	<u>--</u>	<u>--</u>	<u>--</u>
5) Overflow Spillway Crest	<u>1843.0</u>	<u>50</u>	<u>240</u>

DISCHARGES:

	<u>Volume</u> (cfs)
1) Average Daily	<u>Unknown</u>
2) Overflow Spillway @ Maximum High Water (Top of Dam)	<u>189</u>
3) Emergency Spillway @ Design High Water	<u>--</u>
4) Principal Spillway @ Emergency Spillway Crest	<u>--</u>
5) Low Level Outlet @ Principal Spillway Crest	<u>25</u>
6) Total (of all facilities) @ Maximum High Water	<u>214</u>
7) Maximum Known Flood	<u>Unknown</u>
8) At Time of Inspection	<u>2+</u>

CREST:

ELEVATION: 1845.6 (NGVD)

Type Earthen crest above embankment of stone fill between concrete and stone masonry wall

Width 20 feet Length 155 feet

Spillover Concrete overflow spillway weir

Location Center of embankment

SPILLWAY:

OVERFLOW	EMERGENCY
1843.0 (NGVD)	Elevation
Broad-crested weir	Type
20 feet	Width
Weir	<u>Type of Control</u>
--	Uncontrolled
None	Controlled
One	Type: (Flashboards; gate)
17.4 foot weir	Number
Concrete	Size/Length
Continuously	Invert Material
Unknown	Anticipated Length of Operating Service
Unknown	Chute Length
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)

Type: _____

Location: _____

Records:

Date Unknown

Max. Reading Unknown

FLOOD WATER CONTROL SYSTEM:

Warning System None in effect

Method of Controlled Releases (mechanisms) "Stop boards" control the reservoir
drain

DRAINAGE AREA: 2,847 acres = 4.45 square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type Rural, Woodlands

Terrain - Relief Rolling to hilly uplands

Surface - Soil Glacial till

Runoff Potential (existing or planned extensive alterations to existing surface or subsurface conditions)

Primarily woodlands with scattered open fields; glacial till soils;

average watershed slope is 10 ± percent, some residential homes and

roadways; some future development around lake possible

Potential Sedimentation problem areas (natural or man-made; present or future)

None

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

Flooding of some lakeside cabins is possible

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the reservoir perimeter:

Location: None

Elevation: _____

Reservoir:

Length @ Maximum Pool 4500 ± feet = 0.9 miles (Miles)

Length of Shoreline (@ Spillway Crest) 10,500 ± feet=2.0 miles (Miles)



WATERSHED MAP

**Lake Muskoday Dam
Inventory No. NY 341**

DELAWARE RIVER BASIN

SULLIVAN COUNTY

FREMONT, NEW YORK

FLAHERTY • GIAVARA ASSOCIATES, P.C.



0 2000 4000

SCALE IN FEET

CALCULATIONS

PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CT 06510/203/789-1200

SHEET NO. 1 OF 8
BY RAC DATE 5-4-81
CHK'D BY JIW DATE 5-11-81

WATERSHED DATA - LAKE MUSKODAY FOR HEC-1 SNYDER HYDROGRAPH

INFLOW TO TENNANAH LAKE

$$L = 6000 \text{ FT} = 1.14 \text{ miles}$$

$$L_c = 2000 \text{ FT} = 0.38 \text{ miles}$$

$$C_p = 2.0 \text{ for average slopes}$$

$$\begin{aligned} 1) \quad t_p &= 2.0 (1.14 \times 0.38)^{0.3} \\ &= 1.56 \text{ hours} \end{aligned}$$

$$t_r = \frac{t_p}{5.5} = \frac{1.56}{5.5} = 0.28 \quad \text{USE } t_r = 0.5$$

$$\begin{aligned} t_{pr} &= t_p + 0.25(t_r - t_p) \\ &= 1.56 + 0.25(0.5 - 0.28) \\ &= 1.62 \text{ hours} \end{aligned}$$

$$2) \quad C_p = 0.63 \text{ for Highland Area}$$

$$3) \% \text{ IMPERVIOUS - TENNANAH LAKE}$$

$$\begin{aligned} \text{ROADS } 36,000 \text{ LF} \times 25' &= 900,000 \text{ ft}^2 \\ \text{HOUSES } \pm 125 @ 1000 \text{ ft}^2 &= \underline{125,000 \text{ ft}^2} \\ &1,025,000 \text{ ft}^2 = 23.5 \text{ acres} \end{aligned}$$

$$\frac{23.5 \text{ acres}}{1643.7 \text{ acres}} = 1.4\%$$

$$4) \text{ WATERSHED AREA - TENNANAH LAKE}$$

$$1643.7 \text{ acres} / 640 = 2.57 \text{ square miles}$$

Based on 1" = 2000' USGS MAP

PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CT 06510/203/789-1200

SHEET NO. 2 OF 8
BY RAC DATE 5-1-81
CHK'D. BY ILW DATE 5-11-81

INFLOW TO LAKE MUSKODAY

$$L = 4500 \text{ ft} = 0.85 \text{ miles}$$

$$L_c = 2000 \text{ ft} = 0.38 \text{ miles}$$

$C_T = 2.0$ for average slopes

$$\begin{aligned} 5) \quad t_p &= C_T (L + L_c)^{0.3} \\ &= 2.0 (0.85 + 0.38)^{0.3} = 1.42 \text{ hours} \end{aligned}$$

$$t_r = \frac{t_p}{5.5} = \frac{1.42}{5.5} = 0.26 \quad \text{USE } t_r = 0.5$$

$$\begin{aligned} t_{pr} &= t_p + 0.25 (t_r - t_p) \\ &= 1.42 + 0.25 (0.5 - 0.26) \\ &= 1.48 \text{ hours} \end{aligned}$$

$$6) \quad C_p = 0.63 \text{ for Highland Area}$$

7) % IMPERVIOUS - LAKE MUSKODAY

$$\begin{aligned} \text{ROADS} \quad 18,000 \text{ LF} \times 25 \text{ LF} &= 450,000 \text{ FT}^2 \\ \text{HOUSES} \quad \pm 70 @ 1000 \text{ FT}^2 &= \frac{70,000 \text{ FT}^2}{520,000 \text{ FT}^2} \end{aligned}$$

$$520,000 \text{ FT}^2 = 11.9 \text{ AC}$$

8) WATERSHED AREA - LAKE MUSKODAY

$$12029 \text{ AC} / 640 = 1.88 \text{ Square Miles}$$

PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY



FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CT 06510/203/788-1200

SHEET NO. 3 OF 5
BY PAC DATE 5-9-81
CHK'D. BY ILW DATE 5-11-81

2) RAINFALL DATA

(FROM HYDROMeteorological Report No. 33)

24 HOUR DURATION PMP = 20.7 INCHES
FOR 200 Square Miles

<u>DURATION (HOURS)</u>	<u>ADJ FACTOR %</u>
6	111
12	122
24	133
48	143

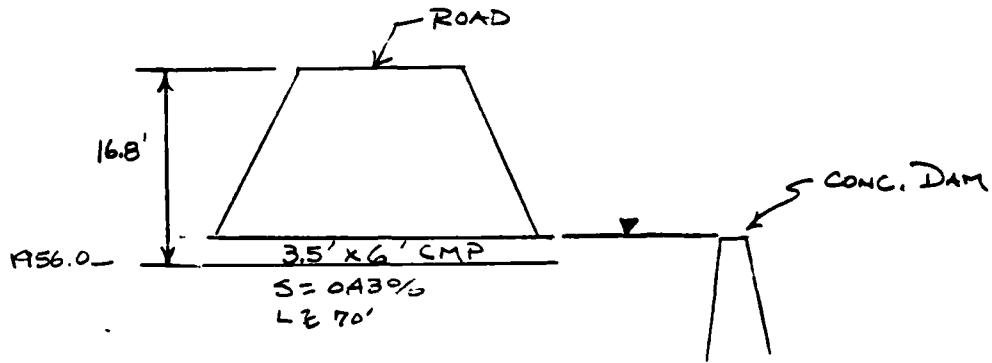
PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY

f.g

FLAHERTY-GIAYARA ASSOCIATES SHEET NO. 4 OF 8
ENVIRONMENTAL DESIGN CONSULTANTS BY RAC DATE 5-5-81
ONE COLUMBUS PLAZA, NEW HAVEN, CT 06510/203/780-1200 CHK'D. BY ILW DATE 5-11-81

TENNANAH LAKE STAGE - DISCHARGE DATA

FOR HEC-DB, ROUTE through Tennanah Lake
FIRST, then Route through LAKE MUSKODAY



① OUTLET CONTROLS

USING NOMOGRAPHS FOUND IN U.S. DEPARTMENT OF
TRANSPORTATION HYDRAULIC CHARTS FOR THE SELECTION
OF HIGHWAY Culverts, HYDRAULIC ENGINEERING Circular
NO. 5, the following discharges were READ.

<u>STAGE</u>	<u>Discharge</u>
1956.0	0
1959.5	35
1963.2	60
1963.7	53
1964.7	115
1965.7	142
1966.7	165
1967.7	185
1968.7	200
1969.7	220
1970.7	240
1971.7	250
1972.7	270
1973.7	280
1974.7	300
1975.7	305

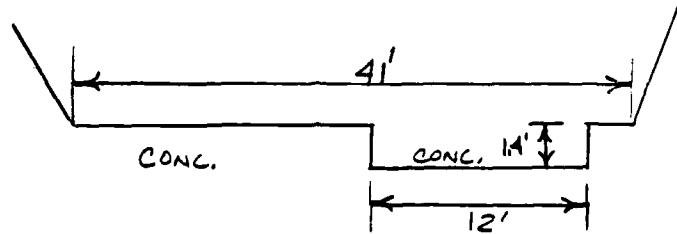
PROJECT CORPS Dam
NY 341
Lake Muskeopay



FLAHERTY-GIAVARA ASSOCIATES SHEET NO. 5 OF 8
ENVIRONMENTAL DESIGN CONSULTANTS BY DAC DATE 5-5-81
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/788-1200 CHK'D. BY TLW DATE 5-11-81

TENNANAG LAKE Cont.

② CHECK OUTFLOW OF CONC DAM



A) IF $H = 3.0'$ $Q = ?$

$$\begin{aligned} Q_1 &= CLH^{1.5} \\ Q_1 &= (3)(12)H^{1.5} \\ &= 36H^{1.5} \\ &= 36(3) \\ &= 187 \end{aligned}$$

$$\begin{aligned} Q_2 &= CLH^{1.5} \\ Q_2 &= (3)(29)H^{1.5} \\ &= 87H^{1.5} \\ &= 87(1.6) \\ &= 176 \end{aligned}$$

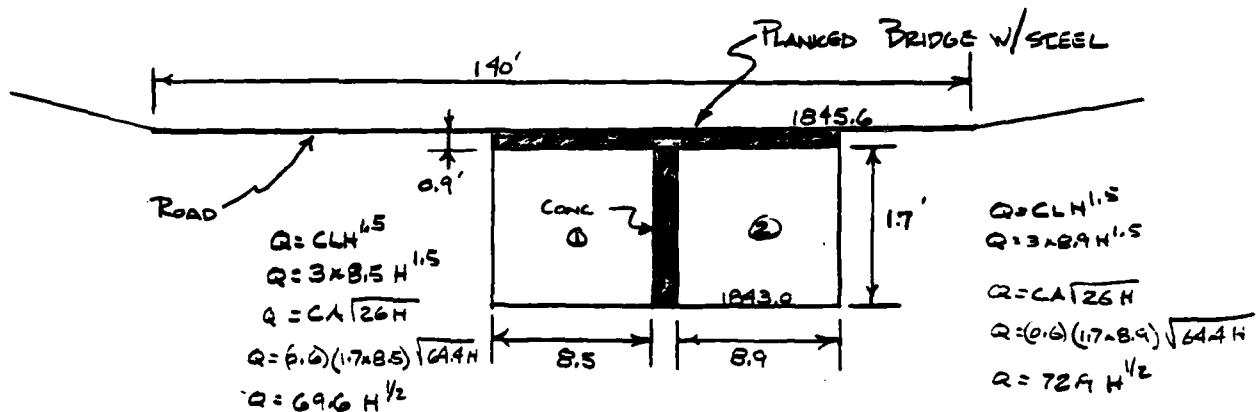
$$Q_T = 187 + 176 = 363 \text{ cfs}$$

B) $363 \text{ cfs} > 305 \text{ cfs}$ \therefore Flow Through
the CMP CONTROLS.



Lake Muskoday

STAGE DISCHARGE DATA
NTS



STAGE DISCHARGE - Spillway Section
↓ Dam OVERTOPPING

STAGE $Q = 3(8.5)H^{1.5}$ $Q_2 = 3(8.9)H^{1.5}$ $Q_1 = 69.6 H^{1/2}$ $Q_2 = 72.9 H^{1/2}$ $Q_T = 2.5(140)H^{1.5}$ DISCHARGE

1843.0		0
1843.5	$3(8.5)(5)^{1.5}$	18.5
1844.0	$3(8.5)(1)$	52.2
1844.5	$3(8.5)(1.5)^{1.5}$	95.9
1844.7	$3(8.5)(1.7)^{1.5}$	115.7
1844.75	* $69.6(0.9)^{1/2}$	135.2
1845.2	$69.6(1.35)^{1/2}$	165.6
1845.6 ← (TOP OF DAM)	$69.6(1.75)^{1/2}$	188.5
1846.0	$69.6(2.15)^{1/2}$	247.5
1847.0	$69.6(3.15)^{1/2}$	832.7
1848.0	$69.6(4.15)^{1/2}$	1591.6
1849.0	$69.6(5.15)^{1/2}$	2517.6
1850.0	$69.6(6.15)^{1/2}$	3583.7

* AN ORIFICE FLOW CONDITION WAS ASSUMED TO EXIST FOR STAGES EQUAL TO THE BOTTOM OF THE BRIDGE. BOTH ORIFICE AND WEIR FLOW CONDITIONS WERE ASSUMED TO EXIST FOR STAGES GREATER THAN TOP OF THE BRIDGE.

PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY



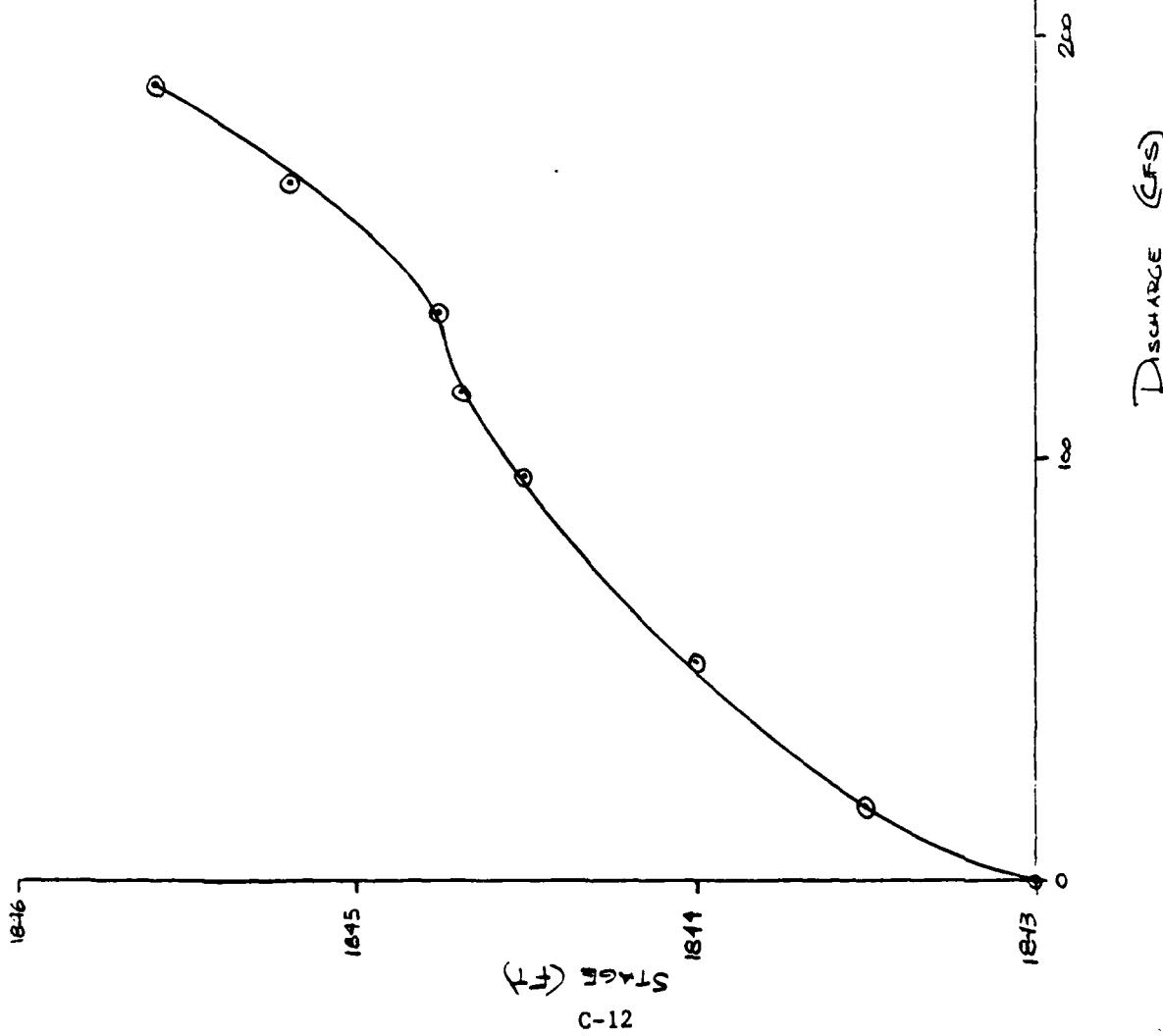
FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN 06510/203/786-1200

SHEET NO. 7 OF 5
BY PAC DATE 5-4-81
CHK'D BY TLW DATE 5-11-81

LAKE MUSKODAY

STAGE DISCHARGE DATA

SPILLWAY SECTION



PROJECT CORPS DAMS
NY 341
LAKE MUSKODAY



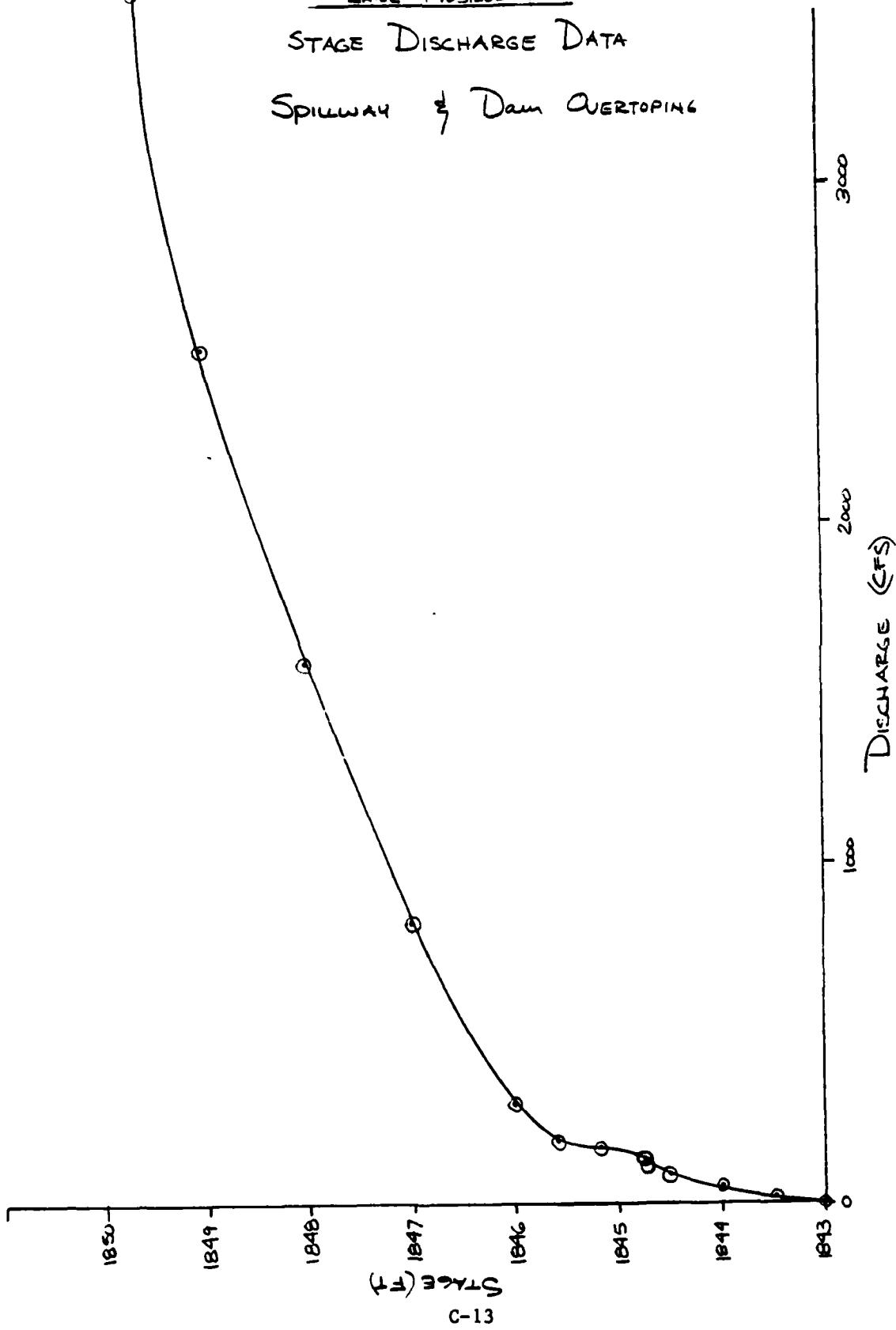
FLAHERTY-GIAVARA ASSOCIATES
ENVIRONMENTAL DESIGN CONSULTANTS
ONE COLUMBUS PLAZA, NEW HAVEN, CONN. 06510/203/780-1200

SHEET NO. 8 OF 8
BY RAC DATE 5-4-81
CHK'D. BY TLW DATE 5-11-81

Lake Muskoday

STAGE DISCHARGE DATA

Spillway \neq Dam OVERTOPING



STAGE (FT)
C-13

HEC-1 FLOOD HYDROGRAPH COMPUTATIONS

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0001

FLAHERTY GIAVARA ASSOCIATES, P. C.
 FLOOD HYDROGRAPH PACKAGE (HEC-1)
 DAH SAFETY VERSION
 LAST MODIFICATION 26 FEB 79

NATIONAL DATA INSPECTION PROGRAM, PHASE I REPORT, CORPS OF ENGINEERS - NEW YORK DISTRICT
 DAM INVENTORY IND. NY 34 LAKE MUSKODAY DAM, SULLIVAN COUNTY, NEW YORK, JULY 23, 1981
 PREPARED BY FLAHERTY GIAVARA ASSOCIATES, P.C., ONE COLUMBUS PLAZA, NEW HAVEN, CONNECTICUT

STATION	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18	Y19	Y20	Y21	Y22	Y23	Y24	Y25	Y26	Y27	Y28	Y29	Y30	Y31	Y32	Y33	Y34	Y35	Y36	Y37	Y38	Y39	Y40	Y41	Y42	Y43	Y44	Y45	Y46	Y47	Y48	Y49	Y50	Y51	Y52	Y53	Y54	Y55	Y56	Y57	Y58	Y59	Y60	Y61	Y62	Y63	Y64	Y65	Y66	Y67	Y68	Y69	Y70	Y71	Y72	Y73	Y74	Y75	Y76	Y77	Y78	Y79	Y80	Y81	Y82	Y83	Y84	Y85	Y86	Y87	Y88	Y89	Y90	Y91	Y92	Y93	Y94	Y95	Y96	Y97	Y98	Y99	Y100	Y101	Y102	Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123	Y124	Y125	Y126	Y127	Y128	Y129	Y130	Y131	Y132	Y133	Y134	Y135	Y136	Y137	Y138	Y139	Y140	Y141	Y142	Y143	Y144	Y145	Y146	Y147	Y148	Y149	Y150	Y151	Y152	Y153	Y154	Y155	Y156	Y157	Y158	Y159	Y160	Y161	Y162	Y163	Y164	Y165	Y166	Y167	Y168	Y169	Y170	Y171	Y172	Y173	Y174	Y175	Y176	Y177	Y178	Y179	Y180	Y181	Y182	Y183	Y184	Y185	Y186	Y187	Y188	Y189	Y190	Y191	Y192	Y193	Y194	Y195	Y196	Y197	Y198	Y199	Y200	Y201	Y202	Y203	Y204	Y205	Y206	Y207	Y208	Y209	Y210	Y211	Y212	Y213	Y214	Y215	Y216	Y217	Y218	Y219	Y220	Y221	Y222	Y223	Y224	Y225	Y226	Y227	Y228	Y229	Y230	Y231	Y232	Y233	Y234	Y235	Y236	Y237	Y238	Y239	Y240	Y241	Y242	Y243	Y244	Y245	Y246	Y247	Y248	Y249	Y250	Y251	Y252	Y253	Y254	Y255	Y256	Y257	Y258	Y259	Y260	Y261	Y262	Y263	Y264	Y265	Y266	Y267	Y268	Y269	Y270	Y271	Y272	Y273	Y274	Y275	Y276	Y277	Y278	Y279	Y280	Y281	Y282	Y283	Y284	Y285	Y286	Y287	Y288	Y289	Y290	Y291	Y292	Y293	Y294	Y295	Y296	Y297	Y298	Y299	Y300	Y301	Y302	Y303	Y304	Y305	Y306	Y307	Y308	Y309	Y310	Y311	Y312	Y313	Y314	Y315	Y316	Y317	Y318	Y319	Y320	Y321	Y322	Y323	Y324	Y325	Y326	Y327	Y328	Y329	Y330	Y331	Y332	Y333	Y334	Y335	Y336	Y337	Y338	Y339	Y340	Y341	Y342	Y343	Y344	Y345	Y346	Y347	Y348	Y349	Y350	Y351	Y352	Y353	Y354	Y355	Y356	Y357	Y358	Y359	Y360	Y361	Y362	Y363	Y364	Y365	Y366	Y367	Y368	Y369	Y370	Y371	Y372	Y373	Y374	Y375	Y376	Y377	Y378	Y379	Y380	Y381	Y382	Y383	Y384	Y385	Y386	Y387	Y388	Y389	Y390	Y391	Y392	Y393	Y394	Y395	Y396	Y397	Y398	Y399	Y400	Y401	Y402	Y403	Y404	Y405	Y406	Y407	Y408	Y409	Y410	Y411	Y412	Y413	Y414	Y415	Y416	Y417	Y418	Y419	Y420	Y421	Y422	Y423	Y424	Y425	Y426	Y427	Y428	Y429	Y430	Y431	Y432	Y433	Y434	Y435	Y436	Y437	Y438	Y439	Y440	Y441	Y442	Y443	Y444	Y445	Y446	Y447	Y448	Y449	Y450	Y451	Y452	Y453	Y454	Y455	Y456	Y457	Y458	Y459	Y460	Y461	Y462	Y463	Y464	Y465	Y466	Y467	Y468	Y469	Y470	Y471	Y472	Y473	Y474	Y475	Y476	Y477	Y478	Y479	Y480	Y481	Y482	Y483	Y484	Y485	Y486	Y487	Y488	Y489	Y490	Y491	Y492	Y493	Y494	Y495	Y496	Y497	Y498	Y499	Y500	Y501	Y502	Y503	Y504	Y505	Y506	Y507	Y508	Y509	Y510	Y511	Y512	Y513	Y514	Y515	Y516	Y517	Y518	Y519	Y520	Y521	Y522	Y523	Y524	Y525	Y526	Y527	Y528	Y529	Y530	Y531	Y532	Y533	Y534	Y535	Y536	Y537	Y538	Y539	Y540	Y541	Y542	Y543	Y544	Y545	Y546	Y547	Y548	Y549	Y550	Y551	Y552	Y553	Y554	Y555	Y556	Y557	Y558	Y559	Y560	Y561	Y562	Y563	Y564	Y565	Y566	Y567	Y568	Y569	Y570	Y571	Y572	Y573	Y574	Y575	Y576	Y577	Y578	Y579	Y580	Y581	Y582	Y583	Y584	Y585	Y586	Y587	Y588	Y589	Y590	Y591	Y592	Y593	Y594	Y595	Y596	Y597	Y598	Y599	Y600	Y601	Y602	Y603	Y604	Y605	Y606	Y607	Y608	Y609	Y610	Y611	Y612	Y613	Y614	Y615	Y616	Y617	Y618	Y619	Y620	Y621	Y622	Y623	Y624	Y625	Y626	Y627	Y628	Y629	Y630	Y631	Y632	Y633	Y634	Y635	Y636	Y637	Y638	Y639	Y640	Y641	Y642	Y643	Y644	Y645	Y646	Y647	Y648	Y649	Y650	Y651	Y652	Y653	Y654	Y655	Y656	Y657	Y658	Y659	Y660	Y661	Y662	Y663	Y664	Y665	Y666	Y667	Y668	Y669	Y670	Y671	Y672	Y673	Y674	Y675	Y676	Y677	Y678	Y679	Y680	Y681	Y682	Y683	Y684	Y685	Y686	Y687	Y688	Y689	Y690	Y691	Y692	Y693	Y694	Y695	Y696	Y697	Y698	Y699	Y700	Y701	Y702	Y703	Y704	Y705	Y706	Y707	Y708	Y709	Y710	Y711	Y712	Y713	Y714	Y715	Y716	Y717	Y718	Y719	Y720	Y721	Y722	Y723	Y724	Y725	Y726	Y727	Y728	Y729	Y730	Y731	Y732	Y733	Y734	Y735	Y736	Y737	Y738	Y739	Y740	Y741	Y742	Y743	Y744	Y745	Y746	Y747	Y748	Y749	Y750	Y751	Y752	Y753	Y754	Y755	Y756	Y757	Y758	Y759	Y760	Y761	Y762	Y763	Y764	Y765	Y766	Y767	Y768	Y769	Y770	Y771	Y772	Y773	Y774	Y775	Y776	Y777	Y778	Y779	Y780	Y781	Y782	Y783	Y784	Y785	Y786	Y787	Y788	Y789	Y790	Y791	Y792	Y793	Y794	Y795	Y796	Y797	Y798	Y799	Y800	Y801	Y802	Y803	Y804	Y805	Y806	Y807	Y808	Y809	Y810	Y811	Y812	Y813	Y814	Y815	Y816	Y817	Y818	Y819	Y820	Y821	Y822	Y823	Y824	Y825	Y826	Y827	Y828	Y829	Y830	Y831	Y832	Y833	Y834	Y835	Y836	Y837	Y838	Y839	Y840	Y841	Y842	Y843	Y844	Y845	Y846	Y847	Y848	Y849	Y850	Y851	Y852	Y853	Y854	Y855	Y856	Y857	Y858	Y859	Y860	Y861	Y862	Y863	Y864	Y865	Y866	Y867	Y868	Y869	Y870	Y871	Y872	Y873	Y874	Y875	Y876	Y877	Y878	Y879	Y880	Y881	Y882	Y883	Y884	Y885	Y886	Y887	Y888	Y889	Y890	Y891	Y892	Y893	Y894	Y895	Y896	Y897	Y898	Y899	Y900	Y901	Y902	Y903	Y904	Y905	Y906	Y907	Y908	Y909	Y910	Y911	Y912	Y913	Y914	Y915	Y916	Y917	Y918	Y919	Y920	Y921	Y922	Y923	Y924	Y925	Y926	Y927	Y928	Y929	Y930	Y931	Y932	Y933	Y934	Y935	Y936	Y937	Y938	Y939	Y940	Y941	Y942	Y943	Y944	Y945	Y946	Y947	Y948	Y949	Y950	Y951	Y952	Y953	Y954	Y955	Y956	Y957	Y958	Y959	Y960	Y961	Y962	Y963	Y964	Y965	Y966	Y967	Y968	Y969	Y970	Y971	Y972	Y973	Y974	Y975	Y976	Y977	Y978	Y979	Y980	Y981	Y982	Y983	Y984	Y985	Y986	Y987	Y988	Y989	Y990	Y991	Y992	Y993	Y994	Y995	Y996	Y997	Y998	Y999	Y1000
---------	----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	-------

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNDFF HYDROGRAPH AT ROUTE HYDROGRAPH TO RUNDFF HYDROGRAPH AT

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0002

COMBINE 2 HYDROGRAPHS AT
ROUTE HYDROGRAPH TO
END OF NETWORK

FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 26 FEB 79

RUN DATE: 8/20/
TIME: 3:52 PM

NATIONAL DAM INSPECTION PROGRAM, PHASE I REPORT, CORPS OF ENGINEERS
DAM INVENTORY NO. NY 341, LAKE HUSKODAY DAM, SULLIVAN COUNTY, NEW YORK
PREPARED BY FLAHERTY GIAVARA ASSOCIATES, P. C., NEW HAVEN, CONNECTICUT

JOB SPECIFICATION

NO	NRIN	IDAY	IRHM	METRC	IPLT	IPRT	NRIN
1	0	30	0	0	0	0	0
2	0	30	0	0	0	0	0
3	0	30	0	0	0	0	0
4	0	30	0	0	0	0	0
5	0	30	0	0	0	0	0
6	0	30	0	0	0	0	0
7	0	30	0	0	0	0	0
8	0	30	0	0	0	0	0
9	0	30	0	0	0	0	0
10	0	30	0	0	0	0	0
11	0	30	0	0	0	0	0
12	0	30	0	0	0	0	0
13	0	30	0	0	0	0	0
14	0	30	0	0	0	0	0
15	0	30	0	0	0	0	0
16	0	30	0	0	0	0	0
17	0	30	0	0	0	0	0
18	0	30	0	0	0	0	0
19	0	30	0	0	0	0	0
20	0	30	0	0	0	0	0
21	0	30	0	0	0	0	0
22	0	30	0	0	0	0	0
23	0	30	0	0	0	0	0
24	0	30	0	0	0	0	0
25	0	30	0	0	0	0	0
26	0	30	0	0	0	0	0
27	0	30	0	0	0	0	0
28	0	30	0	0	0	0	0
29	0	30	0	0	0	0	0
30	0	30	0	0	0	0	0
31	0	30	0	0	0	0	0
32	0	30	0	0	0	0	0
33	0	30	0	0	0	0	0
34	0	30	0	0	0	0	0
35	0	30	0	0	0	0	0
36	0	30	0	0	0	0	0
37	0	30	0	0	0	0	0
38	0	30	0	0	0	0	0
39	0	30	0	0	0	0	0
40	0	30	0	0	0	0	0
41	0	30	0	0	0	0	0
42	0	30	0	0	0	0	0
43	0	30	0	0	0	0	0
44	0	30	0	0	0	0	0
45	0	30	0	0	0	0	0
46	0	30	0	0	0	0	0
47	0	30	0	0	0	0	0
48	0	30	0	0	0	0	0
49	0	30	0	0	0	0	0
50	0	30	0	0	0	0	0
51	0	30	0	0	0	0	0
52	0	30	0	0	0	0	0
53	0	30	0	0	0	0	0
54	0	30	0	0	0	0	0
55	0	30	0	0	0	0	0
56	0	30	0	0	0	0	0
57	0	30	0	0	0	0	0
58	0	30	0	0	0	0	0
59	0	30	0	0	0	0	0
60	0	30	0	0	0	0	0
61	0	30	0	0	0	0	0
62	0	30	0	0	0	0	0
63	0	30	0	0	0	0	0
64	0	30	0	0	0	0	0
65	0	30	0	0	0	0	0
66	0	30	0	0	0	0	0
67	0	30	0	0	0	0	0
68	0	30	0	0	0	0	0
69	0	30	0	0	0	0	0
70	0	30	0	0	0	0	0
71	0	30	0	0	0	0	0
72	0	30	0	0	0	0	0
73	0	30	0	0	0	0	0
74	0	30	0	0	0	0	0
75	0	30	0	0	0	0	0
76	0	30	0	0	0	0	0
77	0	30	0	0	0	0	0
78	0	30	0	0	0	0	0
79	0	30	0	0	0	0	0
80	0	30	0	0	0	0	0
81	0	30	0	0	0	0	0
82	0	30	0	0	0	0	0
83	0	30	0	0	0	0	0
84	0	30	0	0	0	0	0
85	0	30	0	0	0	0	0
86	0	30	0	0	0	0	0
87	0	30	0	0	0	0	0
88	0	30	0	0	0	0	0
89	0	30	0	0	0	0	0
90	0	30	0	0	0	0	0
91	0	30	0	0	0	0	0
92	0	30	0	0	0	0	0
93	0	30	0	0	0	0	0
94	0	30	0	0	0	0	0
95	0	30	0	0	0	0	0
96	0	30	0	0	0	0	0
97	0	30	0	0	0	0	0
98	0	30	0	0	0	0	0
99	0	30	0	0	0	0	0
100	0	30	0	0	0	0	0
101	0	30	0	0	0	0	0
102	0	30	0	0	0	0	0
103	0	30	0	0	0	0	0
104	0	30	0	0	0	0	0
105	0	30	0	0	0	0	0
106	0	30	0	0	0	0	0
107	0	30	0	0	0	0	0
108	0	30	0	0	0	0	0
109	0	30	0	0	0	0	0
110	0	30	0	0	0	0	0
111	0	30	0	0	0	0	0
112	0	30	0	0	0	0	0
113	0	30	0	0	0	0	0
114	0	30	0	0	0	0	0
115	0	30	0	0	0	0	0
116	0	30	0	0	0	0	0
117	0	30	0	0	0	0	0
118	0	30	0	0	0	0	0
119	0	30	0	0	0	0	0
120	0	30	0	0	0	0	0
121	0	30	0	0	0	0	0
122	0	30	0	0	0	0	0
123	0	30	0	0	0	0	0
124	0	30	0	0	0	0	0
125	0	30	0	0	0	0	0
126	0	30	0	0	0	0	0
127	0	30	0	0	0	0	0
128	0	30	0	0	0	0	0
129	0	30	0	0	0	0	0
130	0	30	0	0	0	0	0
131	0	30	0	0	0	0	0
132	0	30	0	0	0	0	0
133	0	30	0	0	0	0	0
134	0	30	0	0	0	0	0
135	0	30	0	0	0	0	0
136	0	30	0	0	0	0	0
137	0	30	0	0	0	0	0
138	0	30	0	0	0	0	0
139	0	30	0	0	0	0	0
140	0	30	0	0	0	0	0
141	0	30	0	0	0	0	0
142	0	30	0	0	0	0	0
143	0	30	0	0	0	0	0
144	0	30	0	0	0	0	0
145	0	30	0	0	0	0	0
146	0	30	0	0	0	0	0
147	0	30	0	0	0	0	0
148	0	30	0	0	0	0	0
149	0	30	0	0	0	0	0
150	0	30	0	0	0	0	0
151	0	30	0	0	0	0	0
152	0	30	0	0	0	0	0
153	0	30	0	0	0	0	0
154	0	30	0	0	0	0	0
155	0	30	0	0	0	0	0
156	0	30	0	0	0	0	0
157	0	30	0	0	0	0	0
158	0	30	0	0	0	0	0
159	0	30	0	0	0	0	0
160	0	30	0	0	0	0	0
161	0	30	0	0	0	0	0
162	0	30	0	0	0	0	0
163	0	30	0	0	0	0	0
164	0	30	0	0	0	0	0
165	0	30	0	0	0	0	0
166	0	30	0	0	0	0	0
167	0	30	0	0	0	0	0
168	0	30	0	0	0	0	0
169	0	30	0	0	0	0	0
170	0	30	0	0	0	0	0
171	0	30	0	0	0	0	0
172	0	30	0	0	0	0	0
173	0	30	0	0	0	0	0
174	0	30	0	0	0	0	0
175	0	30	0	0	0	0	0
176	0	30	0	0	0	0	0
177	0	30	0	0	0	0	0
178	0	30	0	0	0	0	0
179	0	30	0	0	0	0	0
180	0	30	0	0	0	0	0
181	0	30	0	0	0	0	0
182	0	30	0	0	0	0	0
183	0	30	0	0	0	0	0
184	0	30	0	0	0	0	0
185	0	30	0	0	0	0	0
186	0	30	0	0	0	0	0
187	0	30	0	0	0	0	0
188	0	30	0	0	0	0	0
189	0	30	0	0	0	0	0
190	0	30	0	0	0	0	0
191	0	30	0	0	0	0	0
192	0	30	0	0	0	0	0
193	0	30	0	0	0	0	0
194	0	30	0	0	0	0	0
195	0	30	0	0	0	0	0
196	0	30	0	0	0	0	0
197	0	30	0	0	0	0	0
198	0	30	0	0	0	0	0
199	0	30					

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0003

UNIT HYDROGRAPH 18 END-OF-PERIOD ORDINATES, LAG= 1.62 HOURS, CP= 0.63 VOL= 1.00
 90. 318. 346. 622. 513. 362. 11.
 91. 44. 31. 22.
 END-OF-PERIOD FLOW DATA
 COMP G
 1087 1249 1304 1360 1426 1492 1558 1624 1690 1756 1822 1888 1954 2020 2086 2152 2218 2284 2350 2416 2482 2548 2614 2680 2746 2812 2878 2944 3010 3076 3142 3208 3274 3340 3406 3472 3538 3604 3670 3736 3802 3868 3934 3990 4056 4122 4188 4254 4320 4386 4452 4518 4584 4650 4716 4782 4848 4914 4980 5046 5112 5178 5244 5310 5376 5442 5508 5574 5640 5706 5772 5838 5904 5970 6036 6102 6168 6234 6290 6356 6422 6488 6554 6620 6686 6752 6818 6884 6950 6986 7052 7118 7184 7250 7316 7382 7448 7514 7580 7646 7712 7778 7844 7910 7976 8042 8108 8174 8240 8306 8372 8438 8504 8570 8636 8702 8768 8834 8890 8956 8982 9048 9114 9180 9246 9312 9378 9444 9510 9576 9642 9708 9774 9840 9906 9972 10038 10104 10170 10236 10302 10368 10434 10500 10566 10632 10698 10764 10830 10896 10962 11028 11094 11160 11226 11292 11358 11424 11490 11556 11622 11688 11754 11820 11886 11952 12018 12084 12150 12216 12282 12348 12414 12480 12546 12612 12678 12744 12810 12876 12942 12978 13044 13110 13176 13242 13308 13374 13440 13506 13572 13638 13704 13770 13836 13902 13968 14034 14090 14156 14222 14288 14354 14420 14486 14552 14618 14684 14750 14816 14882 14948 15014 15080 15146 15212 15278 15344 15410 15476 15542 15608 15674 15740 15806 15872 15938 15974 16040 16106 16172 16238 16304 16370 16436 16492 16558 16624 16680 16746 16812 16878 16944 17010 17076 17142 17208 17274 17340 17406 17472 17538 17604 17670 17736 17802 17868 17934 17990 18056 18122 18188 18254 18320 18386 18452 18518 18584 18650 18716 18782 18848 18914 18980 19046 19112 19178 19244 19310 19376 19442 19508 19574 19640 19706 19772 19838 19904 19970 20036 20102 20168 20234 20300 20366 20432 20498 20564 20630 20696 20762 20828 20894 20960 21026 21092 21158 21224 21290 21356 21422 21488 21554 21620 21686 21752 21818 21884 21950 22016 22082 22148 22214 22280 22346 22412 22478 22544 22610 22676 22742 22808 22874 22940 22974 23040 23106 23172 23238 23304 23370 23436 23502 23568 23634 23700 23766 23832 23898 23964 24030 24096 24162 24228 24294 24360 24426 24492 24558 24624 24680 24746 24812 24878 24944 25010 25076 25142 25208 25274 25340 25406 25472 25538 25604 25670 25736 25802 25868 25934 25990 26056 26122 26188 26254 26320 26386 26452 26518 26584 26650 26716 26782 26848 26914 26980 27046 27112 27178 27244 27310 27376 27442 27508 27574 27640 27706 27772 27838 27904 27970 28036 28102 28168 28234 28290 28356 28422 28488 28554 28620 28686 28752 28818 28884 28950 28974 29040 29106 29172 29238 29304 29370 29436 29502 29568 29634 29700 29766 29832 29898 29964 29990 30056 30122 30188 30254 30320 30386 30452 30518 30584 30650 30716 30782 30848 30914 30980 31046 31112 31178 31244 31310 31376 31442 31508 31574 31640 31706 31772 31838 31904 31970 32036 32102 32168 32234 32300 32366 32432 32508 32574 32640 32706 32772 32838 32904 32970 33036 33102 33168 33234 33300 33366 33432 33508 33574 33640 33706 33772 33838 33904 33970 34036 34102 34168 34234 34300 34366 34432 34508 34574 34640 34706 34772 34838 34904 34970 35036 35102 35168 35234 35300 35366 35432 35508 35574 35640 35706 35772 35838 35904 35970 36036 36102 36168 36234 36300 36366 36432 36508 36574 36640 36706 36772 36838 36904 36970 37036 37102 37168 37234 37300 37366 37432 37508 37574 37640 37706 37772 37838 37904 37970 38036 38102 38168 38234 38300 38366 38432 38508 38574 38640 38706 38772 38838 38904 38970 39036 39102 39168 39234 39300 39366 39432 39508 39574 39640 39706 39772 39838 39904 39970 40036 40102 40168 40234 40300 40366 40432 40508 40574 40640 40706 40772 40838 40904 40970 41036 41102 41168 41234 41300 41366 41432 41508 41574 41640 41706 41772 41838 41904 41970 42036 42102 42168 42234 42300 42366 42432 42508 42574 42640 42706 42772 42838 42904 42970 43036 43102 43168 43234 43300 43366 43432 43508 43574 43640 43706 43772 43838 43904 43970 44036 44102 44168 44234 44300 44366 44432 44508 44574 44640 44706 44772 44838 44904 44970 45036 45102 45168 45234 45300 45366 45432 45508 45574 45640 45706 45772 45838 45904 45970 46036 46102 46168 46234 46300 46366 46432 46508 46574 46640 46706 46772 46838 46904 46970 47036 47102 47168 47234 47300 47366 47432 47508 47574 47640 47706 47772 47838 47904 47970 48036 48102 48168 48234 48300 48366 48432 48508 48574 48640 48706 48772 48838 48904 48970 49036 49102 49168 49234 49300 49366 49432 49508 49574 49640 49706 49772 49838 49904 49970 50036 50102 50168 50234 50300 50366 50432 50508 50574 50640 50706 50772 50838 50904 50970 51036 51102 51168 51234 51300 51366 51432 51508 51574 51640 51706 51772 51838 51904 51970 52036 52102 52168 52234 52300 52366 52432 52508 52574 52640 52706 52772 52838 52904 52970 53036 53102 53168 53234 53300 53366 53432 53508 53574 53640 53706 53772 53838 53904 53970 54036 54102 54168 54234 54300 54366 54432 54508 54574 54640 54706 54772 54838 54904 54970 55036 55102 55168 55234 55300 55366 55432 55508 55574 55640 55706 55772 55838 55904 55970 56036 56102 56168 56234 56300 56366 56432 56508 56574 56640 56706 56772 56838 56904 56970 57036 57102 57168 57234 57300 57366 57432 57508 57574 57640 57706 57772 57838 57904 57970 58036 58102 58168 58234 58300 58366 58432 58508 58574 58640 58706 58772 58838 58904 58970 59036 59102 59168 59234 59300 59366 59432 59508 59574 59640 59706 59772 59838 59904 59970 60036 60102 60168 60234 60300 60366 60432 60508 60574 60640 60706 60772 60838 60904 60970 61036 61102 61168 61234 61300 61366 61432 61508 61574 61640 61706 61772 61838 61904 61970 62036 62102 62168 62234 62300 62366 62432 62508 62574 62640 62706 62772 62838 62904 62970 63036 63102 63168 63234 63300 63366 63432 63508 63574 63640 63706 63772 63838 63904 63970 64036 64102 64168 64234 64300 64366 64432 64508 64574 64640 64706 64772 64838 64904 64970 65036 65102 65168 65234 65300 65366 65432 65508 65574 65640 65706 65772 65838 65904 65970 66036 66102 66168 66234 66300 66366 66432 66508 66574 66640 66706 66772 66838 66904 66970 67036 67102 67168 67234 67300 67366 67432 67508 67574 67640 67706 67772 67838 67904 67970 68036 68102 68168 68234 68300 68366 68432 68508 68574 68640 68706 68772 68838 68904 68970 69036 69102 69168 69234 69300 69366 69432 69508 69574 69640 69706 69772 69838 69904 69970 70036 70102 70168 70234 70300 70366 70432 70508 70574 70640 70706 70772 70838 70904 70970 71036 71102 71168 71234 71300 71366 71432 71508 71574 71640 71706 71772 71838 71904 71970 72036 72102 72168 72234 72300 72366 72432 72508 72574 72640 72706 72772 72838 72904 72970 73036 73102 73168 73234 73300 73366 73432 73508 73574 73640 73706 73772 73838 73904 73970 74036 74102 74168 74234 74300 74366 74432 74508 74574 74640 74706 74772 74838 74904 74970 75036 75102 75168 75234 75300 75366 75432 75508 75574 75640 75706 75772 75838 75904 75970 76036 76102 76168 76234 76300 76366 76432 76508 76574 76640 76706 76772 76838 76904 76970 77036 77102 77168 77234 77300 77366 77432 77508 77574 77640 77706 77772 77838 77904 77970 78036 78102 78168 78234 78300 78366 78432 78508 78574 78640 78706 78772 78838 78904 78970 79036 79102 79168 79234 79300 79366 79432 79508 79574 79640 79706 79772 79838 79904 79970 80036 80102 80168 80234 80300 80366 80432 80508 80574 80640 80706 80772 80838 80904 80970 81036 81102 81168 81234 81300 81366 81432 81508 81574 81640 81706 81772 81838 81904 81970 82036 82102 82168 82234 82300 82366 82432 82508 82574 82640 82706 82772 82838 82904 82970 83036 83102 83168 83234 83300 83366 83432 83508 83574 83640 83706 83772 83838 83904 83970 84036 84102 84168 84234 84300 84366 84432 84508 84574 84640 84706 84772 84838 84904 84970 85036 85102 85168 85234 85300 85366 85432 85508 85574 85640 85706 85772 85838 85904 85970 86036 86102 86168 86234 86300 86366 86432 86508 86574 86640 86706 86772 86838 86904 86970 87036 87102 87168 87234 87300 87366 87432 87508 87574 87640 87706 87772 87838 87904 87970 88036 88102 88168 88234 88300 88366 88432 88508 88574 88640 88706 88772 88838 88904 88970 89036 89102 89168 89234 89300 89366 89432 89508 89574 89640 89706 89772 89838 89904 89970 90036 90102 90168 90234 90300 90366 90432 90508 90574 90640 90706 90772 90838 90904 90970 91036 91102 91168 91234 91300 91366 91432 91508 91574 91640 91706 91772 91838 91904 91970 92036 92102 92168 92234 92300 92366 92432 92508 92574 92640 92706 92772 92838 92904 92970 93036 93102 93168 93234 93300 93366 93432 93508 93574 93640 93706 93772 93838 93904 93970 94036 94102 94168 94234 94300 94366 94432 94508 94574 94640 94706 94772 94838 94904 94970 95036 95102 95168 95234 95300 95366 95432 95508 95574 95640 95706 95772 95838 95904 95970 96036 96102 96168 96234 96300 96366 96432 96508 96574 96640 96706 96772 96838 96904 96970 97036 97102 97168 97234 97300 97366 97432 97508 97574 97640 97706 97772 97838 97904 97970 98036 98102 98168 98234 98300 98366 98432 98508 98574 98640 98706 98772 98838 98904 98970 99036 99102 99168 99234 99300 99366 99432 99508 99574 99640 99706 99772 99838 99904 99970 100036 100102 100168 100234 100300 100366 100432 100508 100574 100640 100706 100772 100838 100904 100970 101036 101102 101168 101234 101300 101366 101432 101508 101574 101640 101706 101772 101838 101904 101970 102036 102102 102168 102234 102300 102366 102432 102508 102574 102640 102706 102772 102838 102904 102970 103036 103102 103168 103234 103300 103366 103432 103508 103574 103640 103706 103772 103838 103904 103970 104036 104102 104168 104234 104300 104366 104432 104508 104574 104640 104706 104772 104838 104904 104970 105036 105102 105168 105234 105300 105366 105432 105508 105574 105640 105706 105772 105838 105904 105970 106036 106102 106168 106234 106300 106366 106432 106508 106574 106640 106706 106772 106838 106904 106970 107036 107102 107168 107234 107300 107366 107432 107508 107574 107640 107706 107772 107838 107904 107970 108036 108102 108168 108234 108300 108366 108432 108508 108574 108640 108706 108772 108838 108904 108970 109036 109102 109168 109234 109300 109366 109432 109508 109574 109640 109706 109772 109838 109904 109970 110036 110102 110168 110234 110300 110366 110432 110508 110574 110640 110706 110772 110838 110904 110970 111036 111102 111168 111234 111300 111366 111432 111508 111574 111640 111706 111772 111838 111904 111970 112036 112102 112168 112234 112300 112366 112432 112508 112574 112640 112706 112772 112838 112904 112970 113036 113102 113168 113234 113300 113366 113432 113508 113574 113640 113706 113772 113838 113904 113970 114036 114102 114168 114234 114300 114366 114432 114508 114574 114640 114706 114772 114838 114904 114970 115036 115102 115168 115234 115300 115366 115432 115508 115574 115640 115706 115772 115838 115904 115970 116036 116102 116168 116234 116300 116366 116432 116508 116574 116640 116706 116772 116838 116904 116970 117036 117102 117168 117234 117300 117366 117432 117508 117574 117640 117706 117772 117838 117904 117970 118036 118102 118168 118234 118300 118366 118432 118508 118574 118640 118706 118772 118838 118904 118970 119036 119102 119168 119234 119300 119366 119432 119508 119574 119640 119706 119772 119838 119904 119970 120036 120102 120168 120234 120300 120366 120432 120508 120574 120640 120706 120772 120838 120904 120970 121036 121102 121168 121234 121300 121366 121432 121508 121574 121640 121706 121772 121838 121904 121970 122036 122102 122168 122234 122300 122366 122432 122508 122574 122640 122706 122772 122838 122904 122970 123036 123102 123168 123234 123300 123366 123432 123508 123574 123640 123706 123772 123838 123904 123970 124036 124102 124168 124234 124300 124366 124432 124508 124574 124640 124706 124772 124838 124904 124970 125036 125102 125168 125234 125300 125366 125432 125508 125574 125640 125706 125772 125838 125904 125970 126036 126102 126168 126234 126300 126366 126432 126508 126574 126640 126706 126772 126838 126904 126970 127036 127102 127168 127234 127300 127366 127432 127508 127574 127640 127706 127772 127838 127904 127970 128036 128102 128168 128234 128300 128366 128432 128508 128574 128640 128706 128772 128838 128904 128970 129036 129102 129168 129234 129300 129366 129432 129508 129574 129640 129706 129772 129838 129904 129970 130036 130102 130168 130234 130300 130366 130432 130508 130574 130640 130706 130772 130838 130904 130970 131036 131102 131168 131234 131300 131366 131432 131508 131574 131640 131706 131772 131838 131904 131970 132036 132102 132168 132234 132300 132366 132432 13250

PLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0004

卷之三

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0005

311 1 1
321 1 1
331 1 1
341 1 1
351 1 1
361 1 1
371 1 1
381 1 1
391 1 1
401 1 1
411 1 1
421 1 1
431 1 1
441 1 1
451 1 1
461 1 1
471 1 1
481 1 1
491 1 1
501 1 1
511 1 1
521 1 1
531 1 1
541 1 1
551 1 1
561 1 1
571 1 1
581 1 1
591 1 1
601 1 1
611 1 1
621 1 1
631 1 1
641 1 1
651 1 1
661 1 1
671 1 1
681 1 1
691 1 1
701 1 1
711 1 1
721 1 1
731 1 1
741 1 1
751 1 1
761 1 1
771 1 1
781 1 1
791 1 1
801 1 1
811 1 1
821 1 1
831 1 1
841 1 1
851 1 1
861 1 1
871 1 1
881 1 1
111 1 1
112 1 1
113 1 1
114 1 1
115 1 1
116 1 1
117 1 1
118 1 1
119 1 1
120 1 1

F F F F F F C-18

20 30 89
 21 30 90
 22 30 91
 23 30 92
 24 30 93
 25 30 94
 26 30 95
 27 30 96
 28 30 97
 29 30 98
 30 30 99
 31 30 100
 32 30 101
 33 30 102
 34 30 103
 35 30 104
 36 30 105
 37 30 106
 38 30 107
 39 30 108
 40 30 109
 41 30 110
 42 30 111
 43 30 112
 44 30 113
 45 30 114
 46 30 115
 47 30 116
 48 30 117
 49 30 118
 50 30 119
 51 30 120
 52 30 121
 53 30 122
 54 30 123
 55 30 124
 56 30 125
 57 30 126
 58 30 127
 59 30 128
 60 30 129
 61 30 130
 62 30 131
 63 30 132
 64 30 133
 65 30 134
 66 30 135
 67 30 136
 68 30 137
 69 30 138
 70 30 139
 71 30 140
 72 30 141
 73 30 142
 74 30 143
 75 30 144
 76 30 145
 77 30 146
 78 30 147
 79 30 148
 80 30 149
 81 30 150
 82 30 151
 83 30 152
 84 30 153
 85 30 154
 86 30 155
 87 30 156
 88 30 157
 89 30 158
 90 30 159
 91 30 160
 92 30 161
 93 30 162
 94 30 163
 95 30 164
 96 30 165
 97 30 166
 98 30 167
 99 30 168
 100 30 169
 101 30 170
 102 30 171
 103 30 172
 104 30 173
 105 30 174
 106 30 175
 107 30 176
 108 30 177
 109 30 178
 110 30 179
 111 30 180
 112 30 181
 113 30 182
 114 30 183
 115 30 184
 116 30 185
 117 30 186
 118 30 187
 119 30 188
 120 30 189
 121 30 190
 122 30 191
 123 30 192
 124 30 193
 125 30 194
 126 30 195
 127 30 196
 128 30 197
 129 30 198
 130 30 199
 131 30 200
 132 30 201
 133 30 202
 134 30 203
 135 30 204
 136 30 205
 137 30 206
 138 30 207
 139 30 208
 140 30 209
 141 30 210
 142 30 211
 143 30 212
 144 30 213
 145 30 214
 146 30 215
 147 30 216
 148 30 217
 149 30 218
 150 30 219
 151 30 220
 152 30 221
 153 30 222
 154 30 223
 155 30 224
 156 30 225
 157 30 226
 158 30 227
 159 30 228
 160 30 229
 161 30 230
 162 30 231
 163 30 232
 164 30 233
 165 30 234
 166 30 235
 167 30 236
 168 30 237
 169 30 238
 170 30 239
 171 30 240
 172 30 241
 173 30 242
 174 30 243
 175 30 244
 176 30 245
 177 30 246
 178 30 247
 179 30 248
 180 30 249
 181 30 250
 182 30 251
 183 30 252
 184 30 253
 185 30 254
 186 30 255
 187 30 256
 188 30 257
 189 30 258
 190 30 259
 191 30 260
 192 30 261
 193 30 262
 194 30 263
 195 30 264
 196 30 265
 197 30 266
 198 30 267
 199 30 268
 200 30 269
 201 30 270
 202 30 271
 203 30 272
 204 30 273
 205 30 274
 206 30 275
 207 30 276
 208 30 277
 209 30 278
 210 30 279
 211 30 280
 212 30 281
 213 30 282
 214 30 283
 215 30 284
 216 30 285
 217 30 286
 218 30 287
 219 30 288
 220 30 289
 221 30 290
 222 30 291
 223 30 292
 224 30 293
 225 30 294
 226 30 295
 227 30 296
 228 30 297
 229 30 298
 230 30 299
 231 30 300
 232 30 301
 233 30 302
 234 30 303
 235 30 304
 236 30 305
 237 30 306
 238 30 307
 239 30 308
 240 30 309
 241 30 310
 242 30 311
 243 30 312
 244 30 313
 245 30 314
 246 30 315
 247 30 316
 248 30 317
 249 30 318
 250 30 319
 251 30 320
 252 30 321
 253 30 322
 254 30 323
 255 30 324
 256 30 325
 257 30 326
 258 30 327
 259 30 328
 260 30 329
 261 30 330
 262 30 331
 263 30 332
 264 30 333
 265 30 334
 266 30 335
 267 30 336
 268 30 337
 269 30 338
 270 30 339
 271 30 340
 272 30 341
 273 30 342
 274 30 343
 275 30 344
 276 30 345
 277 30 346
 278 30 347
 279 30 348
 280 30 349
 281 30 350
 282 30 351
 283 30 352
 284 30 353
 285 30 354
 286 30 355
 287 30 356
 288 30 357
 289 30 358
 290 30 359
 291 30 360
 292 30 361
 293 30 362
 294 30 363
 295 30 364
 296 30 365
 297 30 366
 298 30 367
 299 30 368
 300 30 369
 301 30 370
 302 30 371
 303 30 372
 304 30 373
 305 30 374
 306 30 375
 307 30 376
 308 30 377
 309 30 378
 310 30 379
 311 30 380
 312 30 381
 313 30 382
 314 30 383
 315 30 384
 316 30 385
 317 30 386
 318 30 387
 319 30 388
 320 30 389
 321 30 390
 322 30 391
 323 30 392
 324 30 393
 325 30 394
 326 30 395
 327 30 396
 328 30 397
 329 30 398
 330 30 399
 331 30 400
 332 30 401
 333 30 402
 334 30 403
 335 30 404
 336 30 405
 337 30 406
 338 30 407
 339 30 408
 340 30 409
 341 30 410
 342 30 411
 343 30 412
 344 30 413
 345 30 414
 346 30 415
 347 30 416
 348 30 417
 349 30 418
 350 30 419
 351 30 420
 352 30 421
 353 30 422
 354 30 423
 355 30 424
 356 30 425
 357 30 426
 358 30 427
 359 30 428
 360 30 429
 361 30 430
 362 30 431
 363 30 432
 364 30 433
 365 30 434
 366 30 435
 367 30 436
 368 30 437
 369 30 438
 370 30 439
 371 30 440
 372 30 441
 373 30 442
 374 30 443
 375 30 444
 376 30 445
 377 30 446
 378 30 447
 379 30 448
 380 30 449
 381 30 450
 382 30 451
 383 30 452
 384 30 453
 385 30 454
 386 30 455
 387 30 456
 388 30 457
 389 30 458
 390 30 459
 391 30 460
 392 30 461
 393 30 462
 394 30 463
 395 30 464
 396 30 465
 397 30 466
 398 30 467
 399 30 468
 400 30 469
 401 30 470
 402 30 471
 403 30 472
 404 30 473
 405 30 474
 406 30 475
 407 30 476
 408 30 477
 409 30 478
 410 30 479
 411 30 480
 412 30 481
 413 30 482
 414 30 483
 415 30 484
 416 30 485
 417 30 486
 418 30 487
 419 30 488
 420 30 489
 421 30 490
 422 30 491
 423 30 492
 424 30 493
 425 30 494
 426 30 495
 427 30 496
 428 30 497
 429 30 498
 430 30 499
 431 30 500
 432 30 501
 433 30 502
 434 30 503
 435 30 504
 436 30 505
 437 30 506
 438 30 507
 439 30 508
 440 30 509
 441 30 510
 442 30 511
 443 30 512
 444 30 513
 445 30 514
 446 30 515
 447 30 516
 448 30 517
 449 30 518
 450 30 519
 451 30 520
 452 30 521
 453 30 522
 454 30 523
 455 30 524
 456 30 525
 457 30 526
 458 30 527
 459 30 528
 460 30 529
 461 30 530
 462 30 531
 463 30 532
 464 30 533
 465 30 534
 466 30 535
 467 30 536
 468 30 537
 469 30 538
 470 30 539
 471 30 540
 472 30 541
 473 30 542
 474 30 543
 475 30 544
 476 30 545
 477 30 546
 478 30 547
 479 30 548
 480 30 549
 481 30 550
 482 30 551
 483 30 552
 484 30 553
 485 30 554
 486 30 555
 487 30 556
 488 30 557
 489 30 558
 490 30 559
 491 30 560
 492 30 561
 493 30 562
 494 30 563
 495 30 564
 496 30 565
 497 30 566
 498 30 567
 499 30 568
 500 30 569
 501 30 570
 502 30 571
 503 30 572
 504 30 573
 505 30 574
 506 30 575
 507 30 576
 508 30 577
 509 30 578
 510 30 579
 511 30 580
 512 30 581
 513 30 582
 514 30 583
 515 30 584
 516 30 585
 517 30 586
 518 30 587
 519 30 588
 520 30 589
 521 30 590
 522 30 591
 523 30 592
 524 30 593
 525 30 594
 526 30 595
 527 30 596
 528 30 597
 529 30 598
 530 30 599
 531 30 600
 532 30 601
 533 30 602
 534 30 603
 535 30 604
 536 30 605
 537 30 606
 538 30 607
 539 30 608
 540 30 609
 541 30 610
 542 30 611
 543 30 612
 544 30 613
 545 30 614
 546 30 615
 547 30 616
 548 30 617
 549 30 618
 550 30 619
 551 30 620
 552 30 621
 553 30 622
 554 30 623
 555 30 624
 556 30 625
 557 30 626
 558 30 627
 559 30 628
 560 30 629
 561 30 630
 562 30 631
 563 30 632
 564 30 633
 565 30 634
 566 30 635
 567 30 636
 568 30 637
 569 30 638
 570 30 639
 571 30 640
 572 30 641
 573 30 642
 574 30 643
 575 30 644
 576 30 645
 577 30 646
 578 30 647
 579 30 648
 580 30 649
 581 30 650
 582 30 651
 583 30 652
 584 30 653
 585 30 654
 586 30 655
 587 30 656
 588 30 657
 589 30 658
 590 30 659
 591 30 660
 592 30 661
 593 30 662
 594 30 663
 595 30 664
 596 30 665
 597 30 666
 598 30 667
 599 30 668
 600 30 669
 601 30 670
 602 30 671
 603 30 672
 604 30 673
 605 30 674
 606 30 675
 607 30 676
 608 30 677
 609 30 678
 610 30 679
 611 30 680
 612 30 681
 613 30 682
 614 30 683
 615 30 684
 616 30 685
 617 30 686
 618 30 687
 619 30 688
 620 30 689
 621 30 690
 622 30 691
 623 30 692
 624 30 693
 625 30 694
 626 30 695
 627 30 696
 628 30 697
 629 30 698
 630 30 699
 631 30 700
 632 30 701
 633 30 702
 634 30 703
 635 30 704
 636 30 705
 637 30 706
 638 30 707
 639 30 708
 640 30 709
 641 30 710
 642 30 711
 643 30 712
 644 30 713
 645 30 714
 646 30 715
 647 30 716
 648 30 717
 649 30 718
 650 30 719
 651 30 720
 652 30 721
 653 30 722
 654 30 723
 655 30 724
 656 30 725
 657 30 726
 658 30 727
 659 30 728
 660 30 729
 661 30 730
 662 30 731
 663 30 732
 664 30 733
 665 30 734
 666 30 735
 667 30 736
 668 30 737
 669 30 738
 670 30 739
 671 30 740
 672 30 741
 673 30 742
 674 30 743
 675 30 744
 676 30 745
 677 30 746
 678 30 747
 679 30 748
 680 30 749
 681 30 750
 682 30 751
 683 30 752
 684 30 753
 685 30 754
 686 30 755
 687 30 756
 688 30 757
 689 30 758
 690 30 759
 691 30 760
 692 30 761
 693 30 762
 694 30 763
 695 30 764
 696 30 765
 697 30 766
 698 30 767
 699 30 768
 700 30 769
 701 30 770
 702 30 771
 703 30 772
 704 30 773
 705 30 774
 706 30 775
 707 30 776
 708 30 777
 709 30 778
 710 30 779
 711 30 780
 712 30 781
 713 30 782
 714 30 783
 715 30 784
 716 30 785
 717 30 786
 718 30 787
 719 30 788
 720 30 789
 721 30 790
 722 30 791
 723 30 792
 724 30 793
 725 30 794
 726 30 795
 727 30 796
 728 30 797
 729 30 798
 730 30 799
 731 30 800
 732 30 801
 733 30 802
 734 30 803
 735 30 804
 736 30 805
 737 30 806
 738 30 807
 739 30 808
 740 30 809
 741 30 810
 742 30 811
 743 30 812
 744 30 813
 745 30 814
 746 30 815
 747 30 816
 748 30 817
 749 30 818
 750 30 819
 751 30 820
 752 30 821
 753 30 822
 754 30 823
 755 30 824
 756 30 825
 757 30 826
 758 30 827
 759 30 828
 760 30 829
 761 30 830
 762 30 831
 763 30 832
 764 30 833
 765 30 834
 766 30 835
 767 30 836
 768 30 837
 769 30 838
 770 30 839
 771 30 840
 772 30 841
 773 30 842
 774 30 843
 775 30 844
 776 30 845
 777 30 846
 778 30 847
 779 30 848
 780 30 849
 781 30 850
 782 30 851
 783 30 852
 784 30 853
 785 30 854
 786 30 855
 787 30 856
 788 30 857
 789 30 858
 790 30 859
 791 30 860
 792 30 861
 793 30 862
 794 30 863
 795 30 864
 796 30 865
 797 30 866
 798 30 867
 799 30 868
 800 30 869
 801 30 870
 802 30 871
 803 30 872
 804 30 873
 805 30 874
 806 30 875
 807 30 876
 808 30 877
 809 30 878
 810 30 879
 811 30 880
 812 30 881
 813 30 882
 814 30 883
 815 30 884
 816 30 885
 817 30 886
 818 30 887
 819 30 888
 820 30 889
 821 30 890
 822 30 891
 823 30 892
 824 30 893
 825 30 894
 826 30 895

CFS
CMS
CMES
INCHES
MM
AC-FT

000N427.
33
623
671
44
29

CF8
CMS
INCHES
AC-FT
HOURS CU M

ପ୍ରକାଶକ

CFS
CMS
CMES
INCHES
MM
AC-FT

000N427.
33
623
671
44
29

CF8
CMS
INCHES
AC-FT
HOURS CU M

ପ୍ରକାଶକ

00004-139	28	350	143	28	19
	278	317	145	300	20
00007-139	28	278	145	300	20
00008-139	27	223	247	31	21
00009-139	27	236	247	31	21

CFS
CMS
CMES
INCHES
MM
AC-FT

000N427.
33
623
671
44
29

CF8
CMS
INCHES
AC-FT
HOURS CU M

၁၀၀

	PEAK	6-HOUR	24-HOUR	TOTAL VOLUME
	CFS	INCHES	INCHES	CU FT
100	78	70	45	40
51	49	47	43	38
34	32	31	29	28
100	721	162	68	8225
51	466	135	48	235
34	20	1.69	2.33	2.48
100	42.88	97.74	83.02	63.02
51	231	322	340	340
34	285	377	412	412

HYDROGRAPH AT STA 1 FOR PLAN 1; RTIO 5

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	8010	8011	8012	8013	8014	8015	8016	8017	8018	8019	8020	8021	8022	8023	8024	8025	8026	8027	8028	8029	8030	8031	8032	8033	8034	8035	8036	8037	8038	8039	8040	8041	8042	8043	8044	8045	8046	8047	8048	8049	8050	8051	8052	8053	8054	8055	8056	8057	8058	8059	8060	8061	8062	8063	8064	8065	8066	8067	8068	8069	8070	8071	8072	8073	8074	8075	8076	8077	8078	8079	8080	8081	8082	8083	8084	8085	8086	8087	8088	8089	8090	8091	8092	8093	8094	8095	8096	8097	8098	8099	80100	80101	80102	80103	80104	80105	80106	80107	80108	80109	80110	80111	80112	80113	80114	80115	80116	80117	80118	80119	80120	80121	80122	80123	80124	80125	80126	80127	80128	80129	80130	80131	80132	80133	80134	80135	80136	80137	80138	80139	80140	80141	80142	80143	80144	80145	80146	80147	80148	80149	80150	80151	80152	80153	80154	80155	80156	80157	80158	80159	80160	80161	80162	80163	80164	80165	80166	80167	80168	80169	80170	80171	80172	80173	80174	80175	80176	80177	80178	80179	80180	80181	80182	80183	80184	80185	80186	80187	80188	80189	80190	80191	80192	80193	80194	80195	80196	80197	80198	80199	80200	80201	80202	80203	80204	80205	80206	80207	80208	80209	80210	80211	80212	80213	80214	80215	80216	80217	80218	80219	80220	80221	80222	80223	80224	80225	80226	80227	80228	80229	80230	80231	80232	80233	80234	80235	80236	80237	80238	80239	80240	80241	80242	80243	80244	80245	80246	80247	80248	80249	80250	80251	80252	80253	80254	80255	80256	80257	80258	80259	80260	80261	80262	80263	80264	80265	80266	80267	80268	80269	80270	80271	80272	80273	80274	80275	80276	80277	80278	80279	80280	80281	80282	80283	80284	80285	80286	80287	80288	80289	80290	80291	80292	80293	80294	80295	80296	80297	80298	80299	80300	80301	80302	80303	80304	80305	80306	80307	80308	80309	80310	80311	80312	80313	80314	80315	80316	80317	80318	80319	80320	80321	80322	80323	80324	80325	80326	80327	80328	80329	80330	80331	80332	80333	80334	80335	80336	80337	80338	80339	80340	80341	80342	80343	80344	80345	80346	80347	80348	80349	80350	80351	80352	80353	80354	80355	80356	80357	80358	80359	80360	80361	80362	80363	80364	80365	80366	80367	80368	80369	80370	80371	80372	80373	80374	80375	80376	80377	80378	80379	80380	80381	80382	80383	80384	80385	80386	80387	80388	80389	80390	80391	80392	80393	80394	80395	80396	80397	80398	80399	80400	80401	80402	80403	80404	80405	80406	80407	80408	80409	80410	80411	80412

HYDROGRAPH AT STA		1 FOR PLAN 1, RTIO 7	
1.	1.	1.	1.
1.	1.	1.	1.
1.	0.	0.	1.
27.	24.	35.	31.
15.	15.	33.	33.
15.	15.	36.	32.
25.	25.	46.	57.
80.	80.	130.	429.
131.	129.	1209.	672.
127.	122.	122.	108.
85.	82.	1117.	72.
57.	54.	178.	48.
		52.	50.

PEAK	6-HOUR	24-HOUR	7-DAY	1 MONTH
GFB	848	295	125	14953
CMB	24	8	4	423
INCHES	3.07	4.08	4.51	4.51
MM	77.96	108.62	114.57	114.57
AC	620	595	618	618
THOUSAND CU M	519	723	762	762

HYDROGRAPH AT STA	I FOR PLAN 1		RTIO S	
	2	2	2	2
2	2	2	2	2
2	2	2	2	2
1	1	1	1	1
12	37	87	87	87
12	13	88	88	88
12	13	89	89	89
18	13	90	90	90
18	13	91	91	91
10	12	91	91	91
10	12	92	92	92
37	62	92	92	92
37	62	93	93	93
201	324	93	93	93
201	324	94	94	94
3278	3022	94	94	94
3278	3022	95	95	95
3115	3206	95	95	95
3115	3206	96	96	96
3353	3204	96	96	96
3353	3204	97	97	97
147	136	97	97	97
147	136	98	98	98

HYDROGRAPH AT STA		1 FOR PLAN 1, RATIO 7	
1	1	1	1
0	0	1	1
27	30	31	31
	323	33	33
	6	7	7
	46	92	57
	207	325	60
	107	861	325
	117	1113	429
			670
			108
			492
			104
			100
			100
			69
			64
			46

PEAK	6-HOUR TOTAL	24-HOUR TOTAL	24-HOUR TOTAL	24-HOUR TOTAL
1311	848	295	125	1495
37.	24.	8.	4.	423
	3.07	4.28	4.31	4.51
	77.96	108.62	114.37	114.57
	620.	586.	618.	618.
519.	723.	762.	762.	

HYDROGRAPH AT STA		1 FOR PLAN 1, RTIO 9			
4	3	4	3	4	3
3	2	3	2	3	2
3	1	3	1	3	1
4	1	4	1	4	1
135	173	173	173	173	173
135	172	172	172	172	172
168	209	209	209	209	209
229	262	262	262	262	262
1687	1687	1687	1687	1687	1687
1687	1687	1687	1687	1687	1687
43564	43564	43564	43564	43564	43564
5807	5807	5807	5807	5807	5807
6043	6043	6043	6043	6043	6043
612	612	612	612	612	612

ELAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0010

TENNANAH LAKE ROUTING - MODIFIED PULS METHOD									
	ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	I NAME	I STAGE	I AUTO
1	0	0	0	0	0	0	0	0	0
GLOSS	CLOSS	Avg	ROUTING DATA	ROUTING DATA	IPMP	IPMP	LSTR	LSTR	LSTR
0.0	0.000	0.00	IRE9	ISNAME	IOPT	IOPT	0	0	0
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT		
1	0	0	0.000	0.000	0.000	0	-1		
STAGE	1976.90	1977.90	1963.20	1963.70	1964.70	1965.70	1966.70	1967.70	1968.70
FLDN	1976.70	1977.70	1972.70	1973.70	1974.70	1975.70	1976.70	1977.70	1978.70

SURFACE AREA	156.	184.	273.
CAPACITY	0.	679.	3406.
ELEVATION	1756.	1760.	1780.

END-OF-PERIOD HYDROGRAPH ORDINATES

STATION	1.	PLAN 1, RATIO 1.
TOPEL	DATA	DAM ID
1972.6	GOOD	EXPD
1	2.5	1.5
		100.

OUTFLOW
oooooooooooo

PEAK
T.
O.
CFS
CFS
INCEN
PP
AC
THOMA
CUM

STATION 1
INFLOW (1), OUTFLOW (2) AND OBSERVED FLOW (*)
800. 160. 200. 240.

ପ୍ରକାଶକ

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0012 ...

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0013

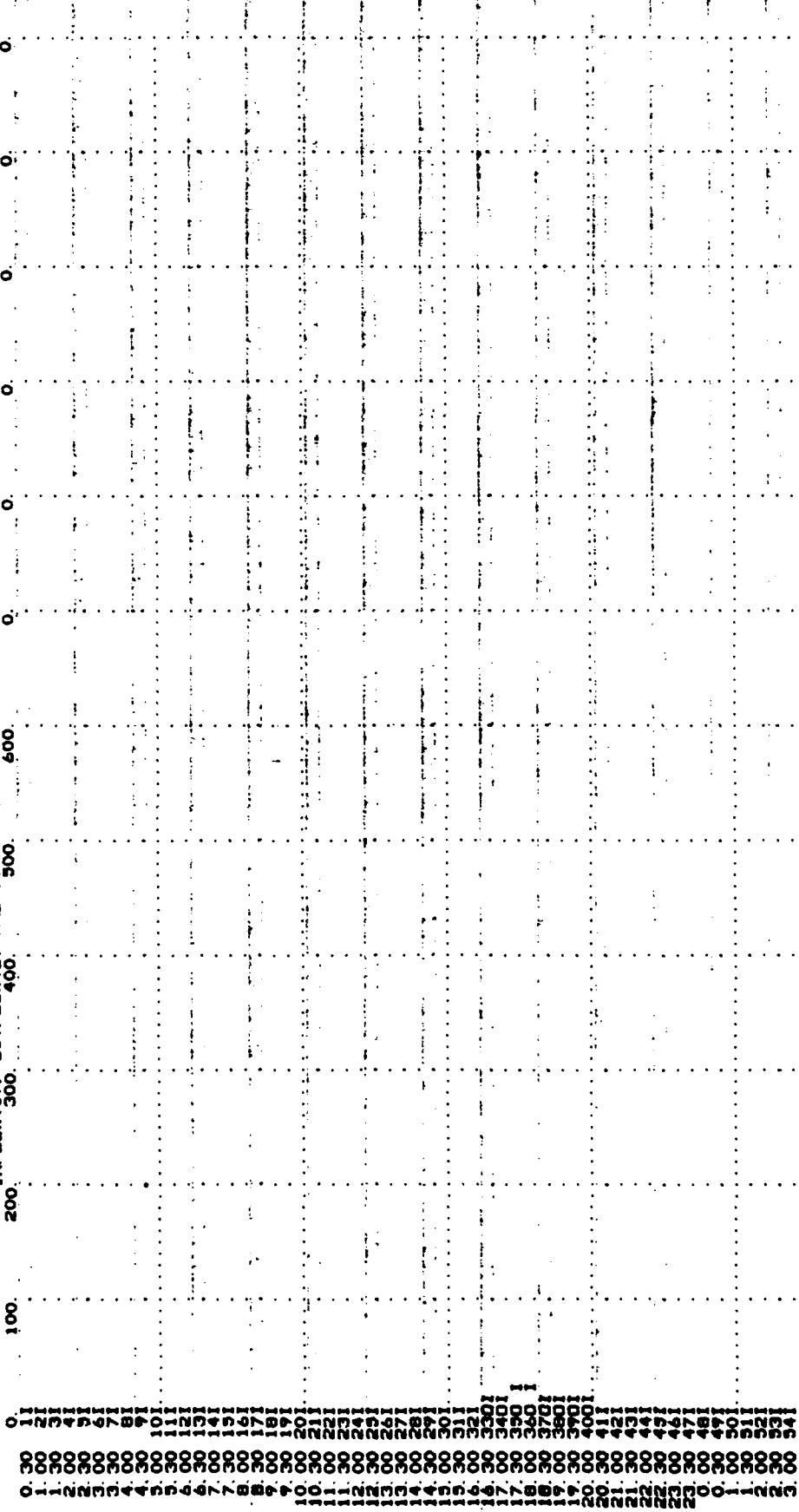
C-26

卷之三

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0015

STATION	1
INFLOW (1), OUTFLOW (D) AND OBSERVED FLOW (*)	
100.	200.
300.	400.
500.	600.



FLAHERTY CIAVARRA ASSOCIATES, P. C.

PAGE 0016

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0017

8. 30113. 01
 9. 00114. 1
 9. 30115. 1
 10. 00116. 1
 10. 30117. 1
 11. 00118. 1
 11. 30119. 1
 12. 00120. 1

#DWN*

STATION 1. PLAN 1. RATIO 3
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW	STORAGE	STAGE
0000000-1-114	0000000-1-114	1956.0
0000000-1-115	0000000-1-115	1956.0
0000000-1-116	0000000-1-116	1956.0
0000000-1-117	0000000-1-117	1956.0
0000000-1-118	0000000-1-118	1956.0
0000000-1-119	0000000-1-119	1956.0
0000000-1-120	0000000-1-120	1956.0
0000000-1-121	0000000-1-121	1956.0
0000000-1-122	0000000-1-122	1956.0
0000000-1-123	0000000-1-123	1956.0
0000000-1-124	0000000-1-124	1956.0
0000000-1-125	0000000-1-125	1956.0
0000000-1-126	0000000-1-126	1956.0
0000000-1-127	0000000-1-127	1956.0
0000000-1-128	0000000-1-128	1956.0
0000000-1-129	0000000-1-129	1956.0
0000000-1-130	0000000-1-130	1956.0
0000000-1-131	0000000-1-131	1956.0
0000000-1-132	0000000-1-132	1956.0
0000000-1-133	0000000-1-133	1956.0
0000000-1-134	0000000-1-134	1956.0
0000000-1-135	0000000-1-135	1956.0
0000000-1-136	0000000-1-136	1956.0
0000000-1-137	0000000-1-137	1956.0
0000000-1-138	0000000-1-138	1956.0
0000000-1-139	0000000-1-139	1956.0
0000000-1-140	0000000-1-140	1956.0
0000000-1-141	0000000-1-141	1956.0
0000000-1-142	0000000-1-142	1956.0
0000000-1-143	0000000-1-143	1956.0
0000000-1-144	0000000-1-144	1956.0
0000000-1-145	0000000-1-145	1956.0
0000000-1-146	0000000-1-146	1956.0
0000000-1-147	0000000-1-147	1956.0
0000000-1-148	0000000-1-148	1956.0
0000000-1-149	0000000-1-149	1956.0
0000000-1-150	0000000-1-150	1956.0
0000000-1-151	0000000-1-151	1956.0
0000000-1-152	0000000-1-152	1956.0
0000000-1-153	0000000-1-153	1956.0
0000000-1-154	0000000-1-154	1956.0
0000000-1-155	0000000-1-155	1956.0
0000000-1-156	0000000-1-156	1956.0
0000000-1-157	0000000-1-157	1956.0
0000000-1-158	0000000-1-158	1956.0
0000000-1-159	0000000-1-159	1956.0
0000000-1-160	0000000-1-160	1956.0
0000000-1-161	0000000-1-161	1956.0
0000000-1-162	0000000-1-162	1956.0
0000000-1-163	0000000-1-163	1956.0
0000000-1-164	0000000-1-164	1956.0
0000000-1-165	0000000-1-165	1956.0
0000000-1-166	0000000-1-166	1956.0
0000000-1-167	0000000-1-167	1956.0
0000000-1-168	0000000-1-168	1956.0
0000000-1-169	0000000-1-169	1956.0
0000000-1-170	0000000-1-170	1956.0
0000000-1-171	0000000-1-171	1956.0
0000000-1-172	0000000-1-172	1956.0
0000000-1-173	0000000-1-173	1956.0
0000000-1-174	0000000-1-174	1956.0
0000000-1-175	0000000-1-175	1956.0
0000000-1-176	0000000-1-176	1956.0
0000000-1-177	0000000-1-177	1956.0
0000000-1-178	0000000-1-178	1956.0
0000000-1-179	0000000-1-179	1956.0
0000000-1-180	0000000-1-180	1956.0
0000000-1-181	0000000-1-181	1956.0
0000000-1-182	0000000-1-182	1956.0
0000000-1-183	0000000-1-183	1956.0
0000000-1-184	0000000-1-184	1956.0
0000000-1-185	0000000-1-185	1956.0
0000000-1-186	0000000-1-186	1956.0
0000000-1-187	0000000-1-187	1956.0
0000000-1-188	0000000-1-188	1956.0
0000000-1-189	0000000-1-189	1956.0
0000000-1-190	0000000-1-190	1956.0
0000000-1-191	0000000-1-191	1956.0
0000000-1-192	0000000-1-192	1956.0
0000000-1-193	0000000-1-193	1956.0
0000000-1-194	0000000-1-194	1956.0
0000000-1-195	0000000-1-195	1956.0
0000000-1-196	0000000-1-196	1956.0
0000000-1-197	0000000-1-197	1956.0
0000000-1-198	0000000-1-198	1956.0
0000000-1-199	0000000-1-199	1956.0
0000000-1-200	0000000-1-200	1956.0

C-30

FLAHERTY OIAVARA ASSOCIATES, P. C.

PAGE 0018 -

17. AT TIME 60.00 HOURS

PEAK OUTFLOW IS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
	CFS	17	13	5	643
	CMS	0	0	0	18
	INCHES	0.06	0.19	0.19	0.19
	MM	1.58	4.82	4.93	4.93
	AC-FT	1.7	26	27	33
	THOUS CU M	11	32	33	33

OVSF

STATION 1 INFLOW(1), OUTFLOW(0) AND OBSERVED FLOW(*)

	100	200	300	400	500	600	700
01	21						
02	31						
03	41						
04	51						
05	61						
06	71						
07	81						
08	91						
09	101						
10	111						
11	121						
12	131						
13	141						
14	151						
15	161						
16	171						
17	181						
18	191						
19	201						
20	211						
21	221						
22	231						
23	241						
24	251						
25	261						
26	271						
27	281						
28	291						
29	301						
30	311						
31	321						
32	331						
33	341						
34	351						
35	361						
36	371						
37	381						
38	391						
39	401						
40	411						
41	421						

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0019

00000000000000
01000000001111111111
00000000000000000012
00000000000000000012

SOUND

C-33

STATION 1. PLAN 1. RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

	OUTFLOW	STORAGE	SOUND
0000000-1-123	0000000-1-123	0000000-1-123	0000000-1-123
118	118	118	118
119	119	119	119
117	117	117	117
118	118	118	118
119	119	119	119
117	117	117	117
0000000-107	0000000-107	0000000-107	0000000-107
25	25	25	25
40	40	40	40
55	55	55	55
60	60	60	60
110	110	110	110
111	111	111	111
112	112	112	112
113	113	113	113
114	114	114	114
115	115	115	115
116	116	116	116
117	117	117	117
118	118	118	118
119	119	119	119
117	117	117	117
0000000-1-125	0000000-1-125	0000000-1-125	0000000-1-125
125	125	125	125
126	126	126	126
127	127	127	127
128	128	128	128
129	129	129	129
130	130	130	130
301	301	301	301
302	302	302	302
303	303	303	303
304	304	304	304
305	305	305	305
306	306	306	306
307	307	307	307
308	308	308	308
309	309	309	309
310	310	310	310
311	311	311	311
312	312	312	312
313	313	313	313
314	314	314	314
315	315	315	315
316	316	316	316
317	317	317	317
318	318	318	318
319	319	319	319
320	320	320	320
321	321	321	321
322	322	322	322
323	323	323	323
324	324	324	324
325	325	325	325
326	326	326	326
327	327	327	327
328	328	328	328
329	329	329	329
330	330	330	330
331	331	331	331
332	332	332	332
333	333	333	333
334	334	334	334
335	335	335	335
336	336	336	336
337	337	337	337
338	338	338	338
339	339	339	339
340	340	340	340
341	341	341	341
342	342	342	342
343	343	343	343
344	344	344	344
345	345	345	345
346	346	346	346
347	347	347	347
348	348	348	348
349	349	349	349
350	350	350	350
351	351	351	351
352	352	352	352
353	353	353	353
354	354	354	354
355	355	355	355
356	356	356	356
357	357	357	357
358	358	358	358
359	359	359	359
360	360	360	360
361	361	361	361
362	362	362	362
363	363	363	363
364	364	364	364
365	365	365	365
366	366	366	366
367	367	367	367
368	368	368	368
369	369	369	369
370	370	370	370
371	371	371	371
372	372	372	372
373	373	373	373
374	374	374	374
375	375	375	375
376	376	376	376
377	377	377	377
378	378	378	378
379	379	379	379
380	380	380	380
381	381	381	381
382	382	382	382
383	383	383	383
384	384	384	384
385	385	385	385
386	386	386	386
387	387	387	387
388	388	388	388
389	389	389	389
390	390	390	390
391	391	391	391
392	392	392	392
393	393	393	393
394	394	394	394
395	395	395	395
396	396	396	396
397	397	397	397
398	398	398	398
399	399	399	399
400	400	400	400
401	401	401	401
402	402	402	402
403	403	403	403
404	404	404	404
405	405	405	405
406	406	406	406
407	407	407	407
408	408	408	408
409	409	409	409
410	410	410	410
411	411	411	411
412	412	412	412
413	413	413	413
414	414	414	414
415	415	415	415
416	416	416	416
417	417	417	417
418	418	418	418
419	419	419	419
420	420	420	420
421	421	421	421
422	422	422	422
423	423	423	423
424	424	424	424
425	425	425	425
426	426	426	426
427	427	427	427
428	428	428	428
429	429	429	429
430	430	430	430
431	431	431	431
432	432	432	432
433	433	433	433
434	434	434	434
435	435	435	435
436	436	436	436
437	437	437	437
438	438	438	438
439	439	439	439
440	440	440	440
441	441	441	441
442	442	442	442
443	443	443	443
444	444	444	444
445	445	445	445
446	446	446	446
447	447	447	447
448	448	448	448
449	449	449	449
450	450	450	450
451	451	451	451
452	452	452	452
453	453	453	453
454	454	454	454
455	455	455	455
456	456	456	456
457	457	457	457
458	458	458	458
459	459	459	459
460	460	460	460
461	461	461	461
462	462	462	462
463	463	463	463
464	464	464	464
465	465	465	465
466	466	466	466
467	467	467	467
468	468	468	468
469	469	469	469
470	470	470	470
471	471	471	471
472	472	472	472
473	473	473	473
474	474	474	474
475	475	475	475
476	476	476	476
477	477	477	477
478	478	478	478
479	479	479	479
480	480	480	480
481	481	481	481
482	482	482	482
483	483	483	483
484	484	484	484
485	485	485	485
486	486	486	486
487	487	487	487
488	488	488	488
489	489	489	489
490	490	490	490
491	491	491	491
492	492	492	492
493	493	493	493
494	494	494	494
495	495	495	495
496	496	496	496
497	497	497	497
498	498	498	498
499	499	499	499
500	500	500	500

FLAHERTY CIAVARO ASSOCIATES, P.C.

PAGE 0023

C-36

END

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0024

61

21. AT TIME 60.00 HOURS		PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFB	21.	21.	21.	16.	6.	767.	227.
CMS				0.	0.	0.	0.23
INCHES				0.23	0.23	0.89	0.89
AC-FIT				0.75	0.75	0.98	0.98
AC-FT				1.00	1.00	1.00	1.00

LC-37

中華書局影印

INFLOW(1), OUTFLOW(0) AND OBSERVED FLOW(**)

卷之三

卷之三

卷之三

卷之三

卷之三

卷之三

Ergonomics in Design, Vol. 17, No. 1, March 2005, pp. 1–10.

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0025

191 201 211 221 231 241 251 261 271 281 291 301 311 321 331 341 351 361 371 381 391 401 411 421 431 441 451 461 471 481 491 501 511 521 531 541 551 561 571 581 591 601 611 621 631 641 651 661 671 681 691 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0026

卷之三

STATION 1: PLAN 1, RATIO &
END-OF-PERIOD HYDROGRAPH ORDINATES
OUTFLOW 00000
00000
00000
00000
00000
00000
00000

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0027

PEAK OUTFLOW IS 22. AT TIME 40.00 HOURS		STATION	24-HOUR		72-HOUR		TOTAL VOLUME
CHG	CHG		6-HOUR	22.	17.	7.	
INCHES	INCHES						
AC-FT	AC-FT						
THOUS CU H	THOUS CU H						
0.30	0.11						
0.41	0.21						
0.50	0.31						
0.60	0.41						
0.70	0.51						
0.80	0.61						
0.90	0.71						
1.00	0.81						
200.	300.	INFLOW (1), DUTTFLW (1) AND OBSERVED FLOW (*)	400.	500.	600.	700.	800.

OVF

STATION

1 INFLOW (1), DUTTFLW (1) AND OBSERVED FLOW (*)

CHG	CHG	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
INCHES	INCHES	22.	22.	17.	7.	829.
AC-FT	AC-FT	1.	0.08	0.24	0.29	23.
THOUS CU H	THOUS CU H	2.04	6.21	6.35	6.35	0.35
		1.1	3.3	3.4	3.4	0.42
		14.	41.	42.	42.	

C-40

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0028

C-41

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0029

**STATION 1, PLAN 1, RATIO 7
END-OF-PERIOD HYDROGRAPH ORDINATES**

PEAK OUTFLOW IS 34. AT TIME 60.00 HOURS

INCHES
CM^S
CM^B
CFS
THOUS^{AC-FT}
CU M

	24-HOUR	72-HOUR	TOTAL	VOLUME
UR	13	10	36	38
UR	1	0	9	61
UR	1	0	52	52
UR	1	0	64	64
UR	1	0	51	51
UR	1	0	62	62
UR	1	0	07	07
UR	1	0	0	0

FLAHERTY CIAVARRA ASSOCIATES, P. C.

PAGE 0032 -

11

**STATION 1, PLAN 1, RATIO 8
END-OF-PERIOD HYDROGRAPH ORDINATES**

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0034

* 804 *

BOB LINTON(11), DULWICH(20), AND OBSERVERED PLOW(4).

C-47

FLAHERTY GIavarA ASSOCIATES, P. C.

PAGE 0035

30 4101
31 421
32 431
33 441
34 451
35 461
36 471
37 481
38 491
39 501
40 511
41 521
42 531
43 541
44 551
45 561
46 571
47 581
48 591
49 601
50 610
51 620
52 630
53 640
54 650
55 660
56 670
57 680
58 690
59 700
60 710
61 720
62 730
63 740
64 750
65 760
66 770
67 780
68 790
69 800
70 810
71 820
72 830
73 840
74 850
75 860
76 870
77 880
78 890
79 891
80 892
81 893
82 894
83 895
84 896
85 897
86 898
87 899
88 890
89 891
90 892
91 893
92 894
93 895
94 896
95 897
96 898
97 899
98 890

AD-A109 969

FLAHERTY-GIAVARA ASSOCIATES NEW HAVEN CT
NATIONAL DAM SAFETY PROGRAM. LAKE MUSKODAY DAM (INVENTORY NUMBER--ETC(U)
SEP 81 H C FLAHERTY

F/G 13/13

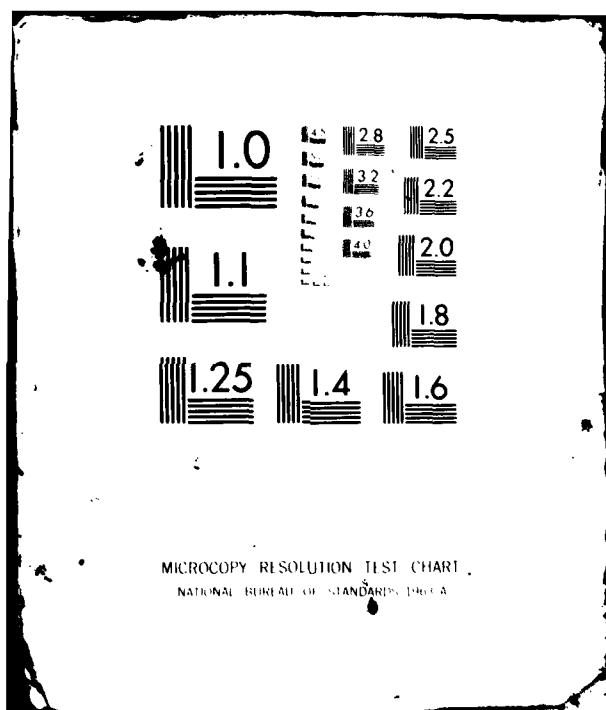
DACW51-81-C-0006

NL

UNCLASSIFIED

2 - 2
A
S. Giavarra

END
DATE FILMED
3.82
DTIG



**STATION 1. PLAN 1. RATIO 9
END-OF-PERIOD HYDROGRAPH ORDINATES**

STATION	PLAN 1, RATIO 9	
	END-OF-PERIOD HYDROGRAPH	ORDINATES
OUTFLOW	0000011343455	0000011343455
	111 121 131 141	111 121 131 141
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224
STORAGE	1121231241251261271281291	1121231241251261271281291
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224
OUTFLOW	0000011343455	0000011343455
	111 121 131 141	111 121 131 141
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224
STORAGE	1121231241251261271281291	1121231241251261271281291
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224
OUTFLOW	0000011343455	0000011343455
	111 121 131 141	111 121 131 141
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224
STORAGE	1121231241251261271281291	1121231241251261271281291
	151 161 171 181	151 161 171 181
	191 201 211 221	191 201 211 221
	231 241 251 261	231 241 251 261
	271 281 291 224	271 281 291 224

三

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0037

PEAK GROUT FLOW 18' 224' FT TIME 59.30 HOURS

PEAK
 224.
 6.
 CFS
 CHS
 INCHES
 MM
 ACFT
 CU
 INCHES

七

C-50

INFLUENZA, OUTPLANE AND OBSERVED FLUENCY
2000. 3000. 4000. 5000. 6000. 7000.

卷之三

卷之三

卷之三

卷之三

卷之三

卷之三

• • • • •

卷之三

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0038...

FLAHERTY & GAVARA ASSOCIATES, P. C.

Page 889

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 3.68 AND R= 2.35 INTERVAL UNIT HYDROGRAPH 15 END-OF-PERIOD ORDINATES: LAG= 1.47 HOURS, CP= 0.63

STRTG	ENDG	GRCBN=	RTOFR=	INTERVAL
00	00	-0.10	1.30	
273	483	300.	373.	242.
28.	18.	12.	8.	5.

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0041

卷之三

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL
GFS	3195.	3194.	1073.	452.	3535.
GFS	143.			13.	156.
CMS				31.	31.
INCHES				43.	42.84
MM				549.	580.84
MM	15.81			51.	51.
MM	40.148			549.	580.84
MM	1584.			2168.	2289.
MM	1754.			2674.	2823.
THOMAS CUMULUS					

* 84 *

C-54

FLAHERTY & IAVARA ASSOCIATES, P. C.

PAGE 0042

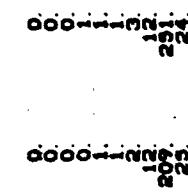
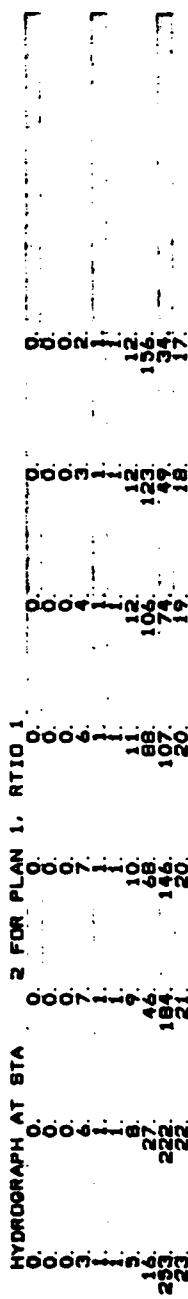
FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0043

15. 30 79.
16. 00 80.
17. 00 81.
18. 00 82.
19. 00 83.
20. 00 84.
21. 00 85.
22. 00 86.
23. 00 87.
24. 00 88.
25. 00 89.
26. 00 90.
27. 00 91.
28. 00 92.
29. 00 93.
30. 00 94.
31. 00 95.
32. 00 96.
33. 00 97.
34. 00 98.
35. 00 99.
36. 00 100.
37. 00 101.
38. 00 102.
39. 00 103.
40. 00 104.
41. 00 105.
42. 00 106.
43. 00 107.
44. 00 108.
45. 00 109.
46. 00 110.
47. 00 111.
48. 00 112.
49. 00 113.
50. 00 114.
51. 00 115.
52. 00 116.
53. 00 117.
54. 00 118.
55. 00 119.
56. 00 120.

C-56

DOME



FLANERTY GIAVARA ASSOCIATES, P.C.

PAGE 0044

	17	16	15	10	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	293					55	23		2770
CM3						21	14		278
INCHES						1.08	1.4		1.14
MM						27.48	29.01		29.01
AC-FT						108	114		114
THOUS CU M						134	141		141

HYDROGRAPH AT STA 2 PURPLAN 1, RT10 2

2 FOR PLAN 1. RTIO 4
 00001 15-1-0744 294 236 243 219
 00002 16-1-0745 295 237 244 220
 00003 17-1-0746 296 238 245 221
 00004 18-1-0747 297 239 246 222
 00005 19-1-0748 298 240 247 223
 00006 20-1-0749 299 241 248 224
 00007 21-1-0750 300 242 249 225
 00008 22-1-0751 301 243 250 226
 00009 23-1-0752 302 244 251 227
 00010 24-1-0753 303 245 252 228
 00011 25-1-0754 304 246 253 229
 00012 26-1-0755 305 247 254 230
 00013 27-1-0756 306 248 255 231
 00014 28-1-0757 307 249 256 232
 00015 29-1-0758 308 250 257 233
 00016 30-1-0759 309 251 258 234
 00017 31-1-0760 310 252 259 235
 00018 01-2-0761 311 253 260 236
 00019 02-2-0762 312 254 261 237
 00020 03-2-0763 313 255 262 238
 00021 04-2-0764 314 256 263 239
 00022 05-2-0765 315 257 264 240
 00023 06-2-0766 316 258 265 241
 00024 07-2-0767 317 259 266 242
 00025 08-2-0768 318 260 267 243
 00026 09-2-0769 319 261 268 244
 00027 10-2-0770 320 262 269 245
 00028 11-2-0771 321 263 270 246
 00029 12-2-0772 322 264 271 247
 00030 13-2-0773 323 265 272 248
 00031 14-2-0774 324 266 273 249
 00032 15-2-0775 325 267 274 250
 00033 16-2-0776 326 268 275 251
 00034 17-2-0777 327 269 276 252
 00035 18-2-0778 328 270 277 253
 00036 19-2-0779 329 271 278 254
 00037 20-2-0780 330 272 279 255
 00038 21-2-0781 331 273 280 256
 00039 22-2-0782 332 274 281 257
 00040 23-2-0783 333 275 282 258
 00041 24-2-0784 334 276 283 259
 00042 25-2-0785 335 277 284 260
 00043 26-2-0786 336 278 285 261
 00044 27-2-0787 337 279 286 262
 00045 28-2-0788 338 280 287 263
 00046 29-2-0789 339 281 288 264
 00047 30-2-0790 340 282 289 265
 00048 31-2-0791 341 283 290 266
 00049 01-3-0792 342 284 291 267
 00050 02-3-0793 343 285 292 268
 00051 03-3-0794 344 286 293 269
 00052 04-3-0795 345 287 294 270
 00053 05-3-0796 346 288 295 271
 00054 06-3-0797 347 289 296 272
 00055 07-3-0798 348 290 297 273
 00056 08-3-0799 349 291 298 274
 00057 09-3-0800 350 292 299 275
 00058 10-3-0801 351 293 300 276
 00059 11-3-0802 352 294 301 277
 00060 12-3-0803 353 295 302 278
 00061 13-3-0804 354 296 303 279
 00062 14-3-0805 355 297 304 280
 00063 15-3-0806 356 298 305 281
 00064 16-3-0807 357 299 306 282
 00065 17-3-0808 358 300 307 283
 00066 18-3-0809 359 301 308 284
 00067 19-3-0810 360 302 309 285
 00068 20-3-0811 361 303 310 286
 00069 21-3-0812 362 304 311 287
 00070 22-3-0813 363 305 312 288
 00071 23-3-0814 364 306 313 289
 00072 24-3-0815 365 307 314 290
 00073 25-3-0816 366 308 315 291
 00074 26-3-0817 367 309 316 292
 00075 27-3-0818 368 310 317 293
 00076 28-3-0819 369 311 318 294
 00077 29-3-0820 370 312 319 295
 00078 30-3-0821 371 313 320 296
 00079 31-3-0822 372 314 321 297
 00080 01-4-0823 373 315 322 298
 00081 02-4-0824 374 316 323 299
 00082 03-4-0825 375 317 324 300
 00083 04-4-0826 376 318 325 301
 00084 05-4-0827 377 319 326 302
 00085 06-4-0828 378 320 327 303
 00086 07-4-0829 379 321 328 304
 00087 08-4-0830 380 322 329 305
 00088 09-4-0831 381 323 330 306
 00089 10-4-0832 382 324 331 307
 00090 11-4-0833 383 325 332 308
 00091 12-4-0834 384 326 333 309
 00092 13-4-0835 385 327 334 310
 00093 14-4-0836 386 328 335 311
 00094 15-4-0837 387 329 336 312
 00095 16-4-0838 388 330 337 313
 00096 17-4-0839 389 331 338 314
 00097 18-4-0840 390 332 339 315
 00098 19-4-0841 391 333 340 316
 00099 20-4-0842 392 334 341 317
 00100 21-4-0843 393 335 342 318
 00101 22-4-0844 394 336 343 319
 00102 23-4-0845 395 337 344 320
 00103 24-4-0846 396 338 345 321
 00104 25-4-0847 397 339 346 322
 00105 26-4-0848 398 340 347 323
 00106 27-4-0849 399 341 348 324
 00107 28-4-0850 400 342 349 325
 00108 29-4-0851 401 343 350 326
 00109 30-4-0852 402 344 351 327
 00110 31-4-0853 403 345 352 328
 00111 01-5-0854 404 346 353 329
 00112 02-5-0855 405 347 354 330
 00113 03-5-0856 406 348 355 331
 00114 04-5-0857 407 349 356 332
 00115 05-5-0858 408 350 357 333
 00116 06-5-0859 409 351 358 334
 00117 07-5-0860 410 352 359 335
 00118 08-5-0861 411 353 360 336
 00119 09-5-0862 412 354 361 337
 00120 10-5-0863 413 355 362 338
 00121 11-5-0864 414 356 363 339
 00122 12-5-0865 415 357 364 340
 00123 13-5-0866 416 358 365 341
 00124 14-5-0867 417 359 366 342
 00125 15-5-0868 418 360 367 343
 00126 16-5-0869 419 361 368 344
 00127 17-5-0870 420 362 369 345
 00128 18-5-0871 421 363 370 346
 00129 19-5-0872 422 364 371 347
 00130 20-5-0873 423 365 372 348
 00131 21-5-0874 424 366 373 349
 00132 22-5-0875 425 367 374 350
 00133 23-5-0876 426 368 375 351
 00134 24-5-0877 427 369 376 352
 00135 25-5-0878 428 370 377 353
 00136 26-5-0879 429 371 378 354
 00137 27-5-0880 430 372 379 355
 00138 28-5-0881 431 373 380 356
 00139 29-5-0882 432 374 381 357
 00140 30-5-0883 433 375 382 358
 00141 31-5-0884 434 376 383 359
 00142 01-6-0885 435 377 384 360
 00143 02-6-0886 436 378 385 361
 00144 03-6-0887 437 379 386 362
 00145 04-6-0888 438 380 387 363
 00146 05-6-0889 439 381 388 364
 00147 06-6-0890 440 382 389 365
 00148 07-6-0891 441 383 390 366
 00149 08-6-0892 442 384 391 367
 00150 09-6-0893 443 385 392 368
 00151 10-6-0894 444 386 393 369
 00152 11-6-0895 445 387 394 370
 00153 12-6-0896 446 388 395 371
 00154 13-6-0897 447 389 396 372
 00155 14-6-0898 448 390 397 373
 00156 15-6-0899 449 391 398 374
 00157 16-6-0900 450 392 399 375
 00158 17-6-0901 451 393 400 376
 00159 18-6-0902 452 394 401 377
 00160 19-6-0903 453 395 402 378
 00161 20-6-0904 454 396 403 379
 00162 21-6-0905 455 397 404 380
 00163 22-6-0906 456 398 405 381
 00164 23-6-0907 457 399 406 382
 00165 24-6-0908 458 400 407 383
 00166 25-6-0909 459 401 408 384
 00167 26-6-0910 460 402 409 385
 00168 27-6-0911 461 403 410 386
 00169 28-6-0912 462 404 411 387
 00170 29-6-0913 463 405 412 388
 00171 30-6-0914 464 406 413 389
 00172 31-6-0915 465 407 414 390
 00173 01-7-0916 466 408 415 391
 00174 02-7-0917 467 409 416 392
 00175 03-7-0918 468 410 417 393
 00176 04-7-0919 469 411 418 394
 00177 05-7-0920 470 412 419 395
 00178 06-7-0921 471 413 420 396
 00179 07-7-0922 472 414 421 397
 00180 08-7-0923 473 415 422 398
 00181 09-7-0924 474 416 423 399
 00182 10-7-0925 475 417 424 400
 00183 11-7-0926 476 418 425 401
 00184 12-7-0927 477 419 426 402
 00185 13-7-0928 478 420 427 403
 00186 14-7-0929 479 421 428 404
 00187 15-7-0930 480 422 429 405
 00188 16-7-0931 481 423 430 406
 00189 17-7-0932 482 424 431 407
 00190 18-7-0933 483 425 432 408
 00191 19-7-0934 484 426 433 409
 00192 20-7-0935 485 427 434 410
 00193 21-7-0936 486 428 435 411
 00194 22-7-0937 487 429 436 412
 00195 23-7-0938 488 430 437 413
 00196 24-7-0939 489 431 438 414
 00197 25-7-0940 490 432 439 415
 00198 26-7-0941 491 433 440 416
 00199 27-7-0942 492 434 441 417
 00200 28-7-0943 493 435 442 418
 00201 29-7-0944 494 436 443 419
 00202 30-7-0945 495 437 444 420
 00203 31-7-0946 496 438 445 421
 00204 01-8-0947 497 439 446 422
 00205 02-8-0948 498 440 447 423
 00206 03-8-0949 499 441 448 424
 00207 04-8-0950 500 442 449 425
 00208 05-8-0951 501 443 450 426
 00209 06-8-0952 502 444 451 427
 00210 07-8-0953 503 445 452 428
 00211 08-8-0954 504 446 453 429
 00212 09-8-0955 505 447 454 430
 00213 10-8-0956 506 448 455 431
 00214 11-8-0957 507 449 456 432
 00215 12-8-0958 508 450 457 433
 00216 13-8-0959 509 451 458 434
 00217 14-8-0960 510 452 459 435
 00218 15-8-0961 511 453 460 436
 00219 16-8-0962 512 454 461 437
 00220 17-8-0963 513 455 462 438
 00221 18-8-0964 514 456 463 439
 00222 19-8-0965 515 457 464 440
 00223 20-8-0966 516 458 465 441
 00224 21-8-0967 517 459 466 442
 00225 22-8-0968 518 460 467 443
 00226 23-8-0969 519 461 468 444
 00227 24-8-0970 520 462 469 445
 00228 25-8-0971 521 463 470 446
 00229 26-8-0972 522 464 471 447
 00230 27-8-0973 523 465 472 448
 00231 28-8-0974 524 466 473 449
 00232 29-8-0975 525 467 474 450
 00233 30-8-0976 526 468 475 451
 00234 31-8-0977 527 469 476 452
 00235 01-9-0978 528 470 477 453
 00236 02-9-0979 529 471 478 454
 00237 03-9-0980 530 472 479 455
 00238 04-9-0981 531 473 480 456
 00239 05-9-0982 532 474 481 457
 00240 06-9-0983 533 475 482 458
 00241 07-9-0984 534 476 483 459
 00242 08-9-0985 535 477 484 460
 00243 09-9-0986 536 478 485 461
 00244 10-9-0987 537 479 486 462
 00245 11-9-0988 538 480 487 463
 00246 12-9-0989 539 481 488 464
 00247 13-9-0990 540 482 489 465
 00248 14-9-0991 541 483 490 466
 00249 15-9-0992 542 484 491 467
 00250 16-9-0993 543 485 492 468
 00251 17-9-0994 544 486 493 469
 00252 18-9-0995 545 487 494 470
 00253 19-9-0996 546 488 495 471
 00254 20-9-0997 547 489 496 472
 00255 21-9-0998 548 490 497 473
 00256 22-9-0999 549 491 498 474
 00257 23-9-1000 550 492 499 475
 00258 24-9-1001 551 493 500 476
 00259 25-9-1002 552 494 501 477
 00260 26-9-1003 553 495 502 478
 00261 27-9-1004 554 496 503 479
 00262 28-9-1005 555 497 504 480
 00263 29-9-1006 556 498 505 481
 00264 30-9-1007 557 499 506 482
 00265 31-9-1008 558 500 507 483
 00266 01-10-1009 559 501 508 484
 00267 02-10-1010 560 502 509 485
 00268 03-10-1011 561 503 510 486
 00269 04-10-1012 562 504 511 487
 00270 05-10-1013 563 505 512 488
 00271 06-10-1014 564 506 513 489
 00272 07-10-1015 565 507 514 490
 00273 08-10-1016 566 508 515 491
 00274 09-10-1017 567 509 516 492
 00275 10-10-1018 568 510 517 493
 00276 11-10-1019 569 511 518 494
 00277 12-10-1020 570 512 519 495
 00278 13-10-1021 571 513 520 496
 00279 14-10-1022 572 514 521 497
 00280 15-10-1023 573 515 522 498
 00281 16-10-1024 574 516 523 499
 00282 17-10-1025 575 517 524 500
 00283 18-10-1026 576 518 525 501
 00284 19-10-1027 577 519 526 502
 00285 20-10-1028 578 520 527 503
 00286 21-10-1029 579 521 528 504
 00287 22-10-1030 580 522 529 505
 00288 23-10-1031 581 523 530 506
 00289 24-10-1032 582 524 531 507
 00290 25-10-1033 583 525 532 508
 00291 26-10-1034 584 526 533 509
 00292 27-10-1035 585 527 534 510
 00293 28-10-1036 586 528 535 511
 00294 29-10-1037 587 529 536 512
 00295 30-10-1038 588 530 537 513
 00296 31-10-1039 589 531 538 514
 00297 01-11-1040 590 532 539 515
 00298 02-11-1041 591 533 540 516
 00299 03-11-1042 592 534 541 517
 00300 04-11-1043 593 535 542 518
 00301 05-11-1044 594 536 543 519
 00302 06-11-1045 595 537 544 520
 00303 07-11-1046 596 538 545 521
 00304 08-11-1047 597 539 546 522
 00305 09-11-1048 598 540 547 523
 00306 10-11-1049 599 541 548 524
 00307 11-11-1050 600 542 549 525
 00308 12-11-1051 601 543 550 526
 00309 13-11-1052 602 544 551 527
 00310 14-11-1053 603 545 552 528
 00311 15-11-1054 604 546 553 529
 00312 16-11-1055 605 547 554 530
 00313 17-11-1056 606 548 555 531
 00314 18-11-1057 607 549 556 532
 00315 19-11-1058 608 550 557 533
 00316 20-11-1059 609 551 558 534
 00317 21-11-1060 610 552 559 535
 00318 22-11-1061 611 553 560 536
 00319 23-11-1062 612 554 561 537
 00320 24-11-1063 613 555 562 538
 00321 25-11-1064 614 556 563 539
 00322 26-11-1065 615 557 564 540
 00323 27-11-1066 616 558 565 541
 00324 28-11-1067 617 559 566 542
 00325 29-11-1068 618 560 567 543
 00326 30-11-1069 619 561 568 544
 00327 31-11-1070 620 562 569 545
 00328 01-12-1071 621 563 570 546
 00329 02-12-1072 622 564 571 547
 00330 03-12-1073 623 565 572 548
 00331 04-12-1074 624 566 573 549
 00332 05-12-1075 625 567 574 550
 00333 06-12-1076 626 568 575 551
 00334 07-12-1077 627 569 576 552
 00335 08-12-1078 628 570 577 553
 00336 09-12-1079 629 571 578 554
 00337 10-12-1080 630 572 579 555
 00338 11-12-1081 631 573 580 556
 00339 12-12-1082 632 574 581 557
 00340 13-12-1083 633 575 582 558
 00341 14-12-1084 634 576 583 559
 00342 15-12-1085 635 577 584 560
 00343 16-12-1086 636 578 585 561
 00344 17-12-1087 637 579 586 562
 00345 18-12-1088 638 580 587 563
 00346 19-12-1089 639 581 588 564
 00347 20-12-1090 640 582 589 565
 00348 21-12-1091 641 583 590 566
 00349 22-12-1092 642 584 591 567
 00350 23-12-1093 643 585 592 568
 00351

CFB
CHB
INCHEB
AC-FT

CR
CH
CH
IM
I

ဝဝဝက်ကန်မြန်မာရှိ
၂၀၁၅

PEAK	6-HOUR 356	24-HOUR 351	72-HOUR 51	TOT
16	—	10	3	—
		1.74	2.38	2.51
	44.16	60.45	63.82	—
	174	238	252	—

PEAK	6-HOUR	24-HOUR	72-HOUR	totl
606.	383.	131.	55.	
617.	11.	4.	4.	
618.	1.90	2.60	2.60	
	48.18	65.94	69.62	
	190.	260.	272.	

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0047

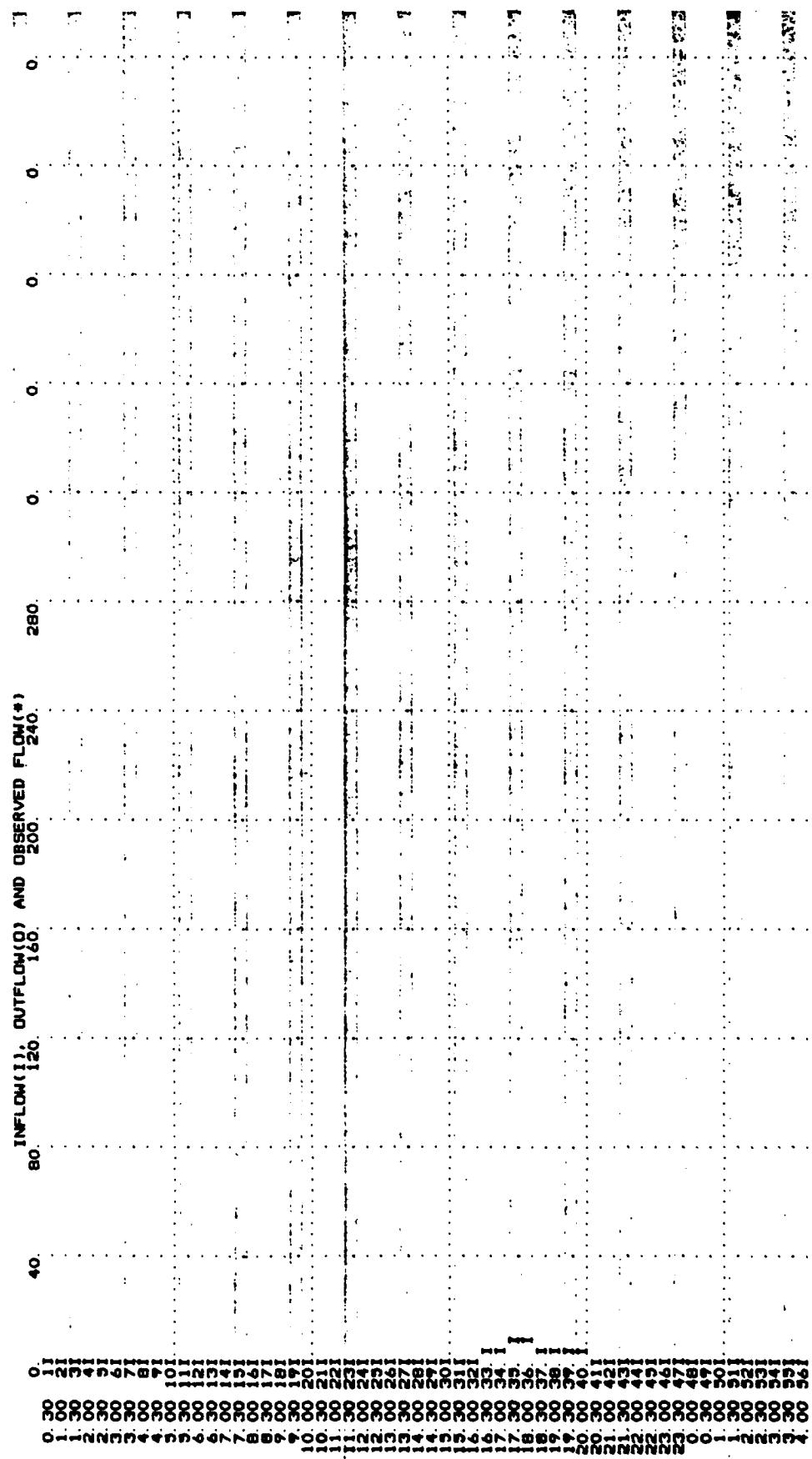
COMBINE HYDROGRAPH

* 5

C-60

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0048



FLAHERTY GIAVARA ASSOCIATES, P.C.

PAGE 0049

11

四

The graph plots three variables against time (0 to 10 hours). The Y-axis ranges from 0 to 400. The X-axis shows time in hours.

Time (hours)	Inflow (1)	Outflow (2)	Observed Flow (*)
0	0	0	0
1	100	150	200
2	150	200	250
3	200	250	300
4	250	300	350
5	300	350	400
6	350	400	450
7	400	450	500
8	450	500	550
9	500	550	600
10	550	600	650

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0051

201
211
221
231
241
251
261
271
281
291
301
311
321
331
341
351
361
371
381
391
401
411
421
431
441
451
461
471
481
491
501
511
521
531
541
551
561
571
581
591
601
611
621
631
641
651
661
671
681
691
701
711
721
731
741
751
761
771
781
791
7A1
7B1
7C1
7D1
7E1
7F1
7G1
7H1
7I1
7J1
7K1
7L1
7M1
7N1
7O1
7P1
7Q1
7R1
7S1
7T1
7U1
7V1
7W1
7X1
7Y1
7Z1
7A2
7B2
7C2
7D2
7E2
7F2
7G2
7H2
7I2
7J2
7K2
7L2
7M2
7N2
7O2
7P2
7Q2
7R2
7S2
7T2
7U2
7V2
7W2
7X2
7Y2
7Z2
7A3
7B3
7C3
7D3
7E3
7F3
7G3
7H3
7I3
7J3
7K3
7L3
7M3
7N3
7O3
7P3
7Q3
7R3
7S3
7T3
7U3
7V3
7W3
7X3
7Y3
7Z3
7A4
7B4
7C4
7D4
7E4
7F4
7G4
7H4
7I4
7J4
7K4
7L4
7M4
7N4
7O4
7P4
7Q4
7R4
7S4
7T4
7U4
7V4
7W4
7X4
7Y4
7Z4
7A5
7B5
7C5
7D5
7E5
7F5
7G5
7H5
7I5
7J5
7K5
7L5
7M5
7N5
7O5
7P5
7Q5
7R5
7S5
7T5
7U5
7V5
7W5
7X5
7Y5
7Z5
7A6
7B6
7C6
7D6
7E6
7F6
7G6
7H6
7I6
7J6
7K6
7L6
7M6
7N6
7O6
7P6
7Q6
7R6
7S6
7T6
7U6
7V6
7W6
7X6
7Y6
7Z6
7A7
7B7
7C7
7D7
7E7
7F7
7G7
7H7
7I7
7J7
7K7
7L7
7M7
7N7
7O7
7P7
7Q7
7R7
7S7
7T7
7U7
7V7
7W7
7X7
7Y7
7Z7
7A8
7B8
7C8
7D8
7E8
7F8
7G8
7H8
7I8
7J8
7K8
7L8
7M8
7N8
7O8
7P8
7Q8
7R8
7S8
7T8
7U8
7V8
7W8
7X8
7Y8
7Z8
7A9
7B9
7C9
7D9
7E9
7F9
7G9
7H9
7I9
7J9
7K9
7L9
7M9
7N9
7O9
7P9
7Q9
7R9
7S9
7T9
7U9
7V9
7W9
7X9
7Y9
7Z9
7A10
7B10
7C10
7D10
7E10
7F10
7G10
7H10
7I10
7J10
7K10
7L10
7M10
7N10
7O10
7P10
7Q10
7R10
7S10
7T10
7U10
7V10
7W10
7X10
7Y10
7Z10
7A11
7B11
7C11
7D11
7E11
7F11
7G11
7H11
7I11
7J11
7K11
7L11
7M11
7N11
7O11
7P11
7Q11
7R11
7S11
7T11
7U11
7V11
7W11
7X11
7Y11
7Z11
7A12
7B12
7C12
7D12
7E12
7F12
7G12
7H12
7I12
7J12
7K12
7L12
7M12
7N12
7O12
7P12
7Q12
7R12
7S12
7T12
7U12
7V12
7W12
7X12
7Y12
7Z12
7A13
7B13
7C13
7D13
7E13
7F13
7G13
7H13
7I13
7J13
7K13
7L13
7M13
7N13
7O13
7P13
7Q13
7R13
7S13
7T13
7U13
7V13
7W13
7X13
7Y13
7Z13
7A14
7B14
7C14
7D14
7E14
7F14
7G14
7H14
7I14
7J14
7K14
7L14
7M14
7N14
7O14
7P14
7Q14
7R14
7S14
7T14
7U14
7V14
7W14
7X14
7Y14
7Z14
7A15
7B15
7C15
7D15
7E15
7F15
7G15
7H15
7I15
7J15
7K15
7L15
7M15
7N15
7O15
7P15
7Q15
7R15
7S15
7T15
7U15
7V15
7W15
7X15
7Y15
7Z15
7A16
7B16
7C16
7D16
7E16
7F16
7G16
7H16
7I16
7J16
7K16
7L16
7M16
7N16
7O16
7P16
7Q16
7R16
7S16
7T16
7U16
7V16
7W16
7X16
7Y16
7Z16
7A17
7B17
7C17
7D17
7E17
7F17
7G17
7H17
7I17
7J17
7K17
7L17
7M17
7N17
7O17
7P17
7Q17
7R17
7S17
7T17
7U17
7V17
7W17
7X17
7Y17
7Z17
7A18
7B18
7C18
7D18
7E18
7F18
7G18
7H18
7I18
7J18
7K18
7L18
7M18
7N18
7O18
7P18
7Q18
7R18
7S18
7T18
7U18
7V18
7W18
7X18
7Y18
7Z18
7A19
7B19
7C19
7D19
7E19
7F19
7G19
7H19
7I19
7J19
7K19
7L19
7M19
7N19
7O19
7P19
7Q19
7R19
7S19
7T19
7U19
7V19
7W19
7X19
7Y19
7Z19
7A20
7B20
7C20
7D20
7E20
7F20
7G20
7H20
7I20
7J20
7K20
7L20
7M20
7N20
7O20
7P20
7Q20
7R20
7S20
7T20
7U20
7V20
7W20
7X20
7Y20
7Z20
7A21
7B21
7C21
7D21
7E21
7F21
7G21
7H21
7I21
7J21
7K21
7L21
7M21
7N21
7O21
7P21
7Q21
7R21
7S21
7T21
7U21
7V21
7W21
7X21
7Y21
7Z21
7A22
7B22
7C22
7D22
7E22
7F22
7G22
7H22
7I22
7J22
7K22
7L22
7M22
7N22
7O22
7P22
7Q22
7R22
7S22
7T22
7U22
7V22
7W22
7X22
7Y22
7Z22
7A23
7B23
7C23
7D23
7E23
7F23
7G23
7H23
7I23
7J23
7K23
7L23
7M23
7N23
7O23
7P23
7Q23
7R23
7S23
7T23
7U23
7V23
7W23
7X23
7Y23
7Z23
7A24
7B24
7C24
7D24
7E24
7F24
7G24
7H24
7I24
7J24
7K24
7L24
7M24
7N24
7O24
7P24
7Q24
7R24
7S24
7T24
7U24
7V24
7W24
7X24
7Y24
7Z24
7A25
7B25
7C25
7D25
7E25
7F25
7G25
7H25
7I25
7J25
7K25
7L25
7M25
7N25
7O25
7P25
7Q25
7R25
7S25
7T25
7U25
7V25
7W25
7X25
7Y25
7Z25
7A26
7B26
7C26
7D26
7E26
7F26
7G26
7H26
7I26
7J26
7K26
7L26
7M26
7N26
7O26
7P26
7Q26
7R26
7S26
7T26
7U26
7V26
7W26
7X26
7Y26
7Z26
7A27
7B27
7C27
7D27
7E27
7F27
7G27
7H27
7I27
7J27
7K27
7L27
7M27
7N27
7O27
7P27
7Q27
7R27
7S27
7T27
7U27
7V27
7W27
7X27
7Y27
7Z27
7A28
7B28
7C28
7D28
7E28
7F28
7G28
7H28
7I28
7J28
7K28
7L28
7M28
7N28
7O28
7P28
7Q28
7R28
7S28
7T28
7U28
7V28
7W28
7X28
7Y28
7Z28
7A29
7B29
7C29
7D29
7E29
7F29
7G29
7H29
7I29
7J29
7K29
7L29
7M29
7N29
7O29
7P29
7Q29
7R29
7S29
7T29
7U29
7V29
7W29
7X29
7Y29
7Z29
7A30
7B30
7C30
7D30
7E30
7F30
7G30
7H30
7I30
7J30
7K30
7L30
7M30
7N30
7O30
7P30
7Q30
7R30
7S30
7T30
7U30
7V30
7W30
7X30
7Y30
7Z30
7A31
7B31
7C31
7D31
7E31
7F31
7G31
7H31
7I31
7J31
7K31
7L31
7M31
7N31
7O31
7P31
7Q31
7R31
7S31
7T31
7U31
7V31
7W31
7X31
7Y31
7Z31
7A32
7B32
7C32
7D32
7E32
7F32
7G32
7H32
7I32
7J32
7K32
7L32
7M32
7N32
7O32
7P32
7Q32
7R32
7S32
7T32
7U32
7V32
7W32
7X32
7Y32
7Z32
7A33
7B33
7C33
7D33
7E33
7F33
7G33
7H33
7I33
7J33
7K33
7L33
7M33
7N33
7O33
7P33
7Q33
7R33
7S33
7T33
7U33
7V33
7W33
7X33
7Y33
7Z33
7A34
7B34
7C34
7D34
7E34
7F34
7G34
7H34
7I34
7J34
7K34
7L34
7M34
7N34
7O34
7P34
7Q34
7R34
7S34
7T34
7U34
7V34
7W34
7X34
7Y34
7Z34
7A35
7B35
7C35
7D35
7E35
7F35
7G35
7H35
7I35
7J35
7K35
7L35
7M35
7N35
7O35
7P35
7Q35
7R35
7S35
7T35
7U35
7V35
7W35
7X35
7Y35
7Z35
7A36
7B36
7C36
7D36
7E36
7F36
7G36
7H36
7I36
7J36
7K36
7L36
7M36
7N36
7O36
7P36
7Q36
7R36
7S36
7T36
7U36
7V36
7W36
7X36
7Y36
7Z36
7A37
7B37
7C37
7D37
7E37
7F37
7G37
7H37
7I37
7J37
7K37
7L37
7M37
7N37
7O37
7P37
7Q37
7R37
7S37
7T37
7U37
7V37
7W37
7X37
7Y37
7Z37
7A38
7B38
7C38
7D38
7E38
7F38
7G38
7H38
7I38
7J38
7K38
7L38
7M38
7N38
7O38
7P38
7Q38
7R38
7S38
7T38
7U38
7V38
7W38
7X38
7Y38
7Z38
7A39
7B39
7C39
7D39
7E39
7F39
7G39
7H39
7I39
7J39
7K39
7L39
7M39
7N39
7O39
7P39
7Q39
7R39
7S39
7T39
7U39
7V39
7W39
7X39
7Y39
7Z39
7A40
7B40
7C40
7D40
7E40
7F40
7G40
7H40
7I40
7J40
7K40
7L40
7M40
7N40
7O40
7P40
7Q40
7R40
7S40
7T40
7U40
7V40
7W40
7X40
7Y40
7Z40
7A41
7B41
7C41
7D41
7E41
7F41
7G41
7H41
7I41
7J41
7K41
7L41
7M41
7N41
7O41
7P41
7Q41
7R41
7S41
7T41
7U41
7V41
7W41
7X41
7Y41
7Z41
7A42
7B42
7C42
7D42
7E42
7F42
7G42
7H42
7I42
7J42
7K42
7L42
7M42
7N42
7O42
7P42
7Q42
7R42
7S42
7T42
7U42
7V42
7W42
7X42
7Y42
7Z42
7A43
7B43
7C43
7D43
7E43
7F43
7G43
7H43
7I43
7J43
7K43
7L43
7M43
7N43
7O43
7P43
7Q43
7R43
7S43
7T43
7U43
7V43
7W43
7X43
7Y43
7Z43
7A44
7B44
7C44
7D44
7E44
7F44
7G44
7H44
7I44
7J44
7K44
7L44
7M44
7N44
7O44
7P44
7Q44
7R44
7S44
7T44
7U44
7V44
7W44
7X44
7Y44
7Z44
7A45
7B45
7C45
7D45
7E45
7F45
7G45
7H45
7I45
7J45
7K45
7L45
7M45
7N45
7O45
7P45
7Q45
7R45
7S45
7T45
7U45
7V45
7W45
7X45
7Y45
7Z45
7A46
7B46
7C46
7D46
7E46
7F46
7G46
7H46
7I46
7J46
7K46
7L46
7M46
7N46
7O46
7P46
7Q46
7R46
7S46
7T46
7U46
7V46
7W46
7X46
7Y46
7Z46
7A47
7B47
7C47
7D47
7E47
7F47
7G47
7H47
7I47
7J47
7K47
7L47
7M47
7N47
7O47
7P47
7Q47
7R47
7S47
7T47
7U47
7V47
7W47
7X47
7Y47
7Z47
7A48
7B48
7C48
7D48
7E48
7F48
7G48
7H48
7I48
7J48
7K48
7L48
7M48
7N48
7O48
7P48
7Q48
7R48
7S48
7T48
7U48
7V48
7W48
7X48
7Y48
7Z48
7A49
7B49
7C49
7D49
7E49
7F49
7G49
7H49
7I49
7J49
7K49
7L49
7M49
7N49
7O49
7P49
7Q49
7R49
7S49
7T49
7U49
7V49
7W49
7X49
7Y49
7Z49
7A50
7B50
7C50
7D50
7E50
7F50
7G50
7H50
7I50
7J50
7K50
7L50
7M50
7N50
7O50
7P50
7Q50
7R50
7S50
7T50
7U50
7V50
7W50
7X50
7Y50
7Z50
7A51
7B51
7C51
7D51
7E51
7F51
7G51
7H51
7I51
7J51
7K51
7L51
7M51
7N51
7O51
7P51
7Q51
7R51
7S51
7T51
7U51
7V51
7W51
7X51
7Y51
7Z51
7A52
7B52
7C52
7D52
7E52
7F52
7G52
7H52
7I52
7J52
7K52
7L52
7M52
7N52
7O52
7P52
7Q52
7R52
7S52
7T52
7U52
7V52
7W52
7X52
7Y52
7Z52
7A53
7B53
7C53
7D53
7E53
7F53
7G53
7H53
7I53
7J53
7K53
7L53
7M53
7N53
7O53
7P53
7Q53
7R53
7S53
7T53
7U53
7V53
7W53
7X53
7Y53
7Z53
7A54
7B54
7C54
7D54
7E54
7F54
7G54
7H54
7I54
7J54
7K54
7L54
7M54
7N54
7O54
7P54
7Q54
7R54
7S54
7T54
7U54
7V54
7W54
7X54
7Y54
7Z54
7A55
7B55
7C55
7D55
7E55
7F55
7G55
7H55
7I55
7J55
7K55
7L55
7M55
7N55
7O55
7P55
7Q55
7R55
7S55
7T55
7U55
7V55
7W55
7X55
7Y55
7Z55
7A56
7B56
7C56
7D56
7E56
7F56
7G56
7H56
7I56
7J56
7K56
7L56
7M56
7N56
7O56
7P56
7Q56
7R56
7S56
7T56
7U56
7V56
7W56
7X56
7Y56
7Z56
7A57
7B57
7C57
7D57
7E57
7F57
7G57
7H57
7I57
7J57
7K57
7L57
7M57
7N57
7O57
7P57
7Q57
7R57
7S57
7T57
7U57
7V57
7W57
7X57
7Y57
7Z57
7A58
7B58
7C58
7D58
7E58
7F58
7G58
7H58
7I58
7J58
7K58
7L58
7M58
7N58
7O58
7P58
7Q58
7R58
7S58
7T58
7U58
7V58
7W58
7X58
7Y58
7Z58
7A59
7B59
7C59
7D59
7E59
7F59
7G59
7H59
7I59
7J59
7K59
7L59
7M59
7N59
7O59
7P59
7Q59
7R59
7S59
7T59
7U59
7V59
7W59
7X59
7Y59
7Z59
7A60
7B60
7C60
7D60
7E60
7F60
7G60
7H60
7I60
7J60
7K60
7L60
7M60
7N60
7O60
7P60
7Q60
7R60
7S60
7T60
7U60
7V60
7W60
7X60
7Y60
7Z60
7A61
7B61
7C61
7D61
7E61
7F61
7G61
7H61
7I61
7J61
7K61
7L61
7M61
7N61
7O61
7P61
7Q61
7R61
7S61
7T61
7U61
7V61
7W61
7X61
7Y61
7Z61
7A62
7B62
7C62
7D62
7E62
7F62
7G62
7H62
7I62
7J62
7K62
7L62
7M62
7N62
7O62
7P62
7Q62
7R62
7S62
7T62
7U62
7V62
7W62
7X62
7Y62
7Z62
7A63
7B63
7C63
7D63
7E63
7F63
7G63
7H63
7I63
7J63
7K63
7L63
7M63
7N63
7O63
7P63
7Q63
7R63
7S63
7T63
7U63
7V63
7W63
7X63
7Y63
7Z63
7A64
7B64
7C64
7D64
7E64
7F64
7G64
7H64
7I64
7J64
7K64
7L64
7M64
7N64
7O64
7P64
7Q64
7R64
7S64
7T64
7U64
7V64
7W64
7X64
7Y64
7Z64
7A65
7B65
7C65
7D65
7E65
7F65
7G65
7H65
7I65
7J65
7K65
7L65
7M65
7N65
7O65
7P65
7Q65
7R65
7S65
7T65
7U65
7V65
7W65
7X65
7Y65
7Z65
7A66
7B66
7C66
7D66
7E66
7F66
7G66
7H66
7I66
7J66
7K66
7L66
7M66
7N66
7O66
7P66
7Q66
7R66
7S66
7T66
7U66
7V66
7W66
7X66
7Y66
7Z66
7A67
7B67
7C67
7D67
7E67
7F67
7G67
7H67
7I67
7J67
7K67
7L67
7M67
7N67
7O67
7P67
7Q67
7R67
7S67
7T67
7U67
7V67
7W67
7X67
7Y67
7Z67
7A68
7B68
7C68
7D68
7E68
7F68
7G68
7H68
7I68
7J68
7K68
7L68
7M68
7N68
7O68
7P68
7Q68
7R68
7S68
7T68
7U68
7V68
7W68
7X68
7Y68
7Z68
7A69
7B69
7C69
7D69
7E69
7F69
7G69
7H69
7I69
7J69
7K69
7L69
7M69
7N69
7O69
7P69
7Q69
7R69
7S69
7T69
7U69
7V69
7W69
7X69
7Y69
7Z69
7A70
7B70
7C70
7D70
7E70
7F70
7G70
7H70
7I70
7J70
7K70
7L70
7M70
7N70
7O70
7P70
7Q70
7R70
7S70
7T70
7U70
7V70
7W70
7X70
7Y70
7Z70
7A71
7B71
7C71
7D71
7E71
7F71
7G71
7H71
7I71
7J71
7K71
7L71
7M71
7N71
7O71
7P71
7Q71
7R71
7S71
7T71
7U71
7V71
7W71
7X71
7Y71
7Z71
7

FLAHERTY & CAVARA ASSOCIATES, P. C.

PAGE 0032 -

79 80-81 NM 82 83 84 85 86 87 88 89 90-91 NM 92 93 94 95 96 97 98 99 00-01 NM 02 03 04 05 06 07 08 09 00-01 NM 02 03 04 05 06 07 08 09
00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09
00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09
00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09 00 01 02 03 04 05 06 07 08 09

C-65

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0033

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	314	327	122	92	6182
CM8	15.	9	3	1	175
INCHES					1.08
MM					27.35
AC-FT					275
THOUS CU M					315

* 100

INFLUX (12 OUTLETS)	OBSERVED FLOW (4)
100	150
150	200
200	250
250	300
300	350
350	400
400	450
450	500

卷之三

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0054 -

DOWN

OUTFLOW #	STATION 2		
	INFLOW(1), OUTFLOW(0) AND OBSERVED FLOW(*)	200.	300.
0.30	0.11	0.	0.
0.38	0.11	0.	0.

FLAHERTY GIAVANA ASSOCIATES, P. C.

PAGE 0056

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0037

C-70

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0058

12.00120. . . . I.....

24

200 INCHES, 130°, OUTFLOW 400, AND OBSERVED, FLUXES, 700.

C-71

FLAHERTY & AVARRA ASSOCIATES, P. C.

PAGE 0039

FLAHERTY SAVARO ASSOCIATES, P. C.

PAGE 0060

三

០០០ក្រសួងពេទ្យ

၁၀၀၀၄၂၈၇၃၁၁

၁၀၀နာရမ်မှုပါန
၂၀၁၄ခုနှစ်

ဝေါဒနံပါန

Digitized by srujanika@gmail.com

• 6 •

1

• 11 •

C-73 -

FLAHERTY GIAVARA ASSOCIATES, P. C.

PAGE 0062

C-75

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0063

4 00104
4 00105
4 00106
5 00107
5 00108
6 00109
6 00110
7 00111
7 00112
8 00113
8 00114
9 00115
9 00116
0 00117
0 00118
1 00119
1 00120

C-76

* ۷۵

200 INFLOW(1), OUTFLOW(0) AND OBSERVED FLOW(*)

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0064

କୁଣ୍ଡଳ ପାତାର ମହିଳାଙ୍କ ନାମରେ ଏହାକିମାନ ଦେଖିଲୁ କିମ୍ବା କିମ୍ବା କିମ୍ବା କିମ୍ବା କିମ୍ବା

9 30 67

10 30 68

11 30 70

12 30 71

13 30 72

14 30 73

15 30 74

16 30 75

17 30 76

18 30 77

19 30 78

20 30 79

21 30 80

22 30 81

23 30 82

24 30 83

25 30 84

26 30 85

27 30 86

28 30 87

29 30 88

30 30 89

31 30 90

32 30 91

33 30 92

34 30 93

35 30 94

36 30 95

37 30 96

38 30 97

39 30 98

40 30 99

41 30 100

42 30 101

43 30 102

44 30 103

45 30 104

46 30 105

47 30 106

48 30 107

49 30 108

50 30 109

51 30 110

52 30 111

53 30 112

54 30 113

55 30 114

56 30 115

57 30 116

58 30 117

59 30 118

60 30 119

61 30 120

	PEAK CFS	6-HOUR CFS	24-HOUR INCHES	72-HOUR CFS	TOTAL VOLUME INCHES
PEAK CFS	2566	1630	.603	235	30639
CFS 73	46	46	.17	7	868
INCHES	3.41	3.41	.04	.34	.34
ACFT	136	136	.97	135.37	135.37
THOUS CFS	808	1195	1.195	1266	1266
	997	997	1.474	1562	1562

INFLATE(1), OUTFLOW(0) AND OBSERVED FLOW(1)

卷之三

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0067

C-8 E

CFB
CMB
INCHES

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0069

FLAHERTY CIAVARRA ASSOCIATES, P. C.

PAGE 0070

— 1 —

FLAHERTY GIavarA ASSOCIATES, P.C.

PAGE 0071

C-84

6.30109	
7.00110	
7.30111	
8.00112	
8.30113	
9.00114	
10.00115	
10.30116	
11.00117	
11.30118	
11.00119	
12.00120	

0VN

HYDROGRAPH ROUTING

LAKE MUSKODAY ROUTING - MODIFIED PULSE METHOD		ROUTING DATA		JPLT		JPRRT		NAME		STAGE		IAUTO	
1STAG	ICMP	IECON	ITAPE	0	0	0	0	0	0	0	0	0	0
2	1			ROUTING	DATA	ROUTING	DATA	NAME	STAGE	IAUTO	IAUTO	IAUTO	IAUTO
GLOSS	CLOSS	AVG	IREG	IREG	IREG	IREG	IREG	NAME	STAGE	IAUTO	IAUTO	IAUTO	IAUTO
0.0	0.000	0.00	1	1	0	0	0	IPPP	IPPP	IPPP	IPPP	IPPP	IPPP
NSTPS	NSTDL	LAD	AMBK	X	X	X	X	IPPP	IPPP	IPPP	IPPP	IPPP	IPPP
1	0	0	0.000	0.000	0.000	0.000	0.000	IPPP	IPPP	IPPP	IPPP	IPPP	IPPP
STAGE	1843.00	1843.30	1844.00	1844.30	1844.70	1844.75	1844.75	TBK	STORA	ISPRAT	ISPRAT	ISPRAT	ISPRAT
1848.00	1847.00	1850.00						0.000	0.000	0.000	0.000	0.000	0.000
FLOW	290.00	318.30	323.80	323.80	323.80	323.80	323.80	75.70	104.00	135.20	169.60	188.90	208.70
SURFACE AREA	30.	96.	194.	194.	194.	194.	194.	0.0	0.0	0.0	0.0	0.0	0.0
CAPACITY	0.	1219.	3704.	3704.	3704.	3704.	3704.	0.0	0.0	0.0	0.0	0.0	0.0
ELEVATION	1843.	1860.	1880.	1880.	1880.	1880.	1880.	EXPW	ELEV	CQAL	CAREA	EXPL	EXPL
	CREL	SPWID	CDGW	CDGW	CDGW	CDGW	CDGW	0.0	0.0	0.0	0.0	0.0	0.0
	1843.0	0.0	0.0	0.0	0.0	0.0	0.0	DAM DATA	DAM ID	DAM ID	DAM ID	DAM ID	DAM ID
	TOPEL	CDGD	EXPD	EXPD	EXPD	EXPD	EXPD	1843.6	2.5	1.5	1.5	1.5	1.5
	STATION	2,	PLAN	1,	PLAN	1,	PLAN	1,	PLAN	1,	PLAN	1,	PLAN
	OUTFLOW	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

END-OF-PERIOD HYDROGRAPH ORDINATES

FLAHERTY & IAVARA ASSOCIATES, P. C.

PAGE 0072 -

C-85

FLAHERTY & AVARA ASSOCIATES, P. C.

PAGE 0073

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0074

C-87-

12.00120.:::1:::0.

12.00120 . . . 1 . . 0 .

STATION 2, PLAN 1, RATIO 2
END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW		STORAGE		STAGE	
00001NNN00	107	0004M24	114	0000-0-0-0270	1843
139	131	108	190	184300010-0-0270	1843
80	82	93	69	184300010-0-0270	1843
61	59	54	55	184300010-0-0270	1843
00001NNN00	146	0004M23	111	0000-0-0-0264	1843
144	144	97	72	184300010-0-0264	1843
88	88	72	57	184300010-0-0264	1843
63	63	56	56	184300010-0-0264	1843
00000NNN07	103	00000NN08	89	0000-0-0-0184	1843
148	98	101	98	184300010-0-0184	1843
86	6	98	58	184300010-0-0184	1843
00000NNN06	85	00000NN09	71	0000-0-0-0184	1843
85	57	105	71	184300010-0-0184	1843
57	1	106	60	184300010-0-0184	1843
00000NNN05	85	00000NN08	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN04	85	00000NN07	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN03	85	00000NN06	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN02	85	00000NN05	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN01	85	00000NN04	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN00	85	00000NN03	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN00	85	00000NN02	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN00	85	00000NN01	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843
00000NNN00	85	00000NN00	89	0000-0-0-0184	1843
85	57	97	61	184300010-0-0184	1843
57	1	97	61	184300010-0-0184	1843

NEW YORK, MARCH 11.—AT TIME 11:00 ON WEDNESDAY

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CFS	168	156	88	36	4325	122
CMB	5	4	-	1	-	0.75
INCMB	15	0.33	0.74	0.75	-	-

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0076 --

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0077

C-90

6 00108
6 30109
7 00110
7 30111
8 00112
8 30113
9 00114
9 30115
10 00116
10 30116
11 00117
11 30117
12 00118
12 30118
13 00119
13 30119
14 00120
14 30120

0 00121
0 30121
1 00122
1 30122
2 00123
2 30123
3 00124
3 30124
4 00125
4 30125
5 00126
5 30126
6 00127
6 30127
7 00128
7 30128
8 00129
8 30129
9 00130
9 30130
10 00131
10 30131
11 00132
11 30132
12 00133
12 30133
13 00134
13 30134
14 00135
14 30135
15 00136
15 30136
16 00137
16 30137
17 00138
17 30138
18 00139
18 30139
19 00140
19 30140
20 00141
20 30141
21 00142
21 30142
22 00143
22 30143
23 00144
23 30144
24 00145
24 30145
25 00146
25 30146
26 00147
26 30147
27 00148
27 30148
28 00149
28 30149
29 00150
29 30150
30 00151
30 30151
31 00152
31 30152
32 00153
32 30153
33 00154
33 30154
34 00155
34 30155
35 00156
35 30156
36 00157
36 30157
37 00158
37 30158
38 00159
38 30159
39 00160
39 30160
40 00161
40 30161
41 00162
41 30162
42 00163
42 30163
43 00164
43 30164
44 00165
44 30165
45 00166
45 30166
46 00167
46 30167
47 00168
47 30168
48 00169
48 30169
49 00170
49 30170
50 00171
50 30171
51 00172
51 30172
52 00173
52 30173
53 00174
53 30174
54 00175
54 30175
55 00176
55 30176
56 00177
56 30177
57 00178
57 30178
58 00179
58 30179
59 00180
59 30180
60 00181
60 30181
61 00182
61 30182
62 00183
62 30183
63 00184
63 30184
64 00185
64 30185
65 00186
65 30186
66 00187
66 30187
67 00188
67 30188
68 00189
68 30189
69 00190
69 30190
70 00191
70 30191
71 00192
71 30192
72 00193
72 30193
73 00194
73 30194
74 00195
74 30195
75 00196
75 30196
76 00197
76 30197
77 00198
77 30198
78 00199
78 30199
79 00200
79 30200
80 00201
80 30201
81 00202
81 30202
82 00203
82 30203
83 00204
83 30204
84 00205
84 30205
85 00206
85 30206
86 00207
86 30207
87 00208
87 30208
88 00209
88 30209
89 00210
89 30210
90 00211
90 30211
91 00212
91 30212
92 00213
92 30213
93 00214
93 30214
94 00215
94 30215
95 00216
95 30216
96 00217
96 30217
97 00218
97 30218
98 00219
98 30219
99 00220
99 30220
100 00221
100 30221
101 00222
101 30222
102 00223
102 30223
103 00224
103 30224
104 00225
104 30225
105 00226
105 30226
106 00227
106 30227
107 00228
107 30228
108 00229
108 30229
109 00230
109 30230
110 00231
110 30231
111 00232
111 30232
112 00233
112 30233
113 00234
113 30234
114 00235
114 30235
115 00236
115 30236
116 00237
116 30237
117 00238
117 30238
118 00239
118 30239
119 00240
119 30240
120 00241
120 30241
121 00242
121 30242
122 00243
122 30243
123 00244
123 30244
124 00245
124 30245
125 00246
125 30246
126 00247
126 30247
127 00248
127 30248
128 00249
128 30249
129 00250
129 30250
130 00251
130 30251
131 00252
131 30252
132 00253
132 30253
133 00254
133 30254
134 00255
134 30255
135 00256
135 30256
136 00257
136 30257
137 00258
137 30258
138 00259
138 30259
139 00260
139 30260
140 00261
140 30261
141 00262
141 30262
142 00263
142 30263
143 00264
143 30264
144 00265
144 30265
145 00266
145 30266
146 00267
146 30267
147 00268
147 30268
148 00269
148 30269
149 00270
149 30270
150 00271
150 30271
151 00272
151 30272
152 00273
152 30273
153 00274
153 30274
154 00275
154 30275
155 00276
155 30276
156 00277
156 30277
157 00278
157 30278
158 00279
158 30279
159 00280
159 30280
160 00281
160 30281
161 00282
161 30282
162 00283
162 30283
163 00284
163 30284
164 00285
164 30285
165 00286
165 30286
166 00287
166 30287
167 00288
167 30288
168 00289
168 30289
169 00290
169 30290
170 00291
170 30291
171 00292
171 30292
172 00293
172 30293
173 00294
173 30294
174 00295
174 30295
175 00296
175 30296
176 00297
176 30297
177 00298
177 30298
178 00299
178 30299
179 00300
179 30300
180 00301
180 30301
181 00302
181 30302
182 00303
182 30303
183 00304
183 30304
184 00305
184 30305
185 00306
185 30306
186 00307
186 30307
187 00308
187 30308
188 00309
188 30309
189 00310
189 30310
190 00311
190 30311
191 00312
191 30312
192 00313
192 30313
193 00314
193 30314
194 00315
194 30315
195 00316
195 30316
196 00317
196 30317
197 00318
197 30318
198 00319
198 30319
199 00320
199 30320
200 00321
200 30321
201 00322
201 30322
202 00323
202 30323
203 00324
203 30324
204 00325
204 30325
205 00326
205 30326
206 00327
206 30327
207 00328
207 30328
208 00329
208 30329
209 00330
209 30330
210 00331
210 30331
211 00332
211 30332
212 00333
212 30333
213 00334
213 30334
214 00335
214 30335
215 00336
215 30336
216 00337
216 30337
217 00338
217 30338
218 00339
218 30339
219 00340
219 30340
220 00341
220 30341
221 00342
221 30342
222 00343
222 30343
223 00344
223 30344
224 00345
224 30345
225 00346
225 30346
226 00347
226 30347
227 00348
227 30348
228 00349
228 30349
229 00350
229 30350
230 00351
230 30351
231 00352
231 30352
232 00353
232 30353
233 00354
233 30354
234 00355
234 30355
235 00356
235 30356
236 00357
236 30357
237 00358
237 30358
238 00359
238 30359
239 00360
239 30360
240 00361
240 30361
241 00362
241 30362
242 00363
242 30363
243 00364
243 30364
244 00365
244 30365
245 00366
245 30366
246 00367
246 30367
247 00368
247 30368
248 00369
248 30369
249 00370
249 30370
250 00371
250 30371
251 00372
251 30372
252 00373
252 30373
253 00374
253 30374
254 00375
254 30375
255 00376
255 30376
256 00377
256 30377
257 00378
257 30378
258 00379
258 30379
259 00380
259 30380
260 00381
260 30381
261 00382
261 30382
262 00383
262 30383
263 00384
263 30384
264 00385
264 30385
265 00386
265 30386
266 00387
266 30387
267 00388
267 30388
268 00389
268 30389
269 00390
269 30390
270 00391
270 30391
271 00392
271 30392
272 00393
272 30393
273 00394
273 30394
274 00395
274 30395
275 00396
275 30396
276 00397
276 30397
277 00398
277 30398
278 00399
278 30399
279 00400
279 30400
280 00401
280 30401
281 00402
281 30402
282 00403
282 30403
283 00404
283 30404
284 00405
284 30405
285 00406
285 30406
286 00407
286 30407
287 00408
287 30408
288 00409
288 30409
289 00410
289 30410
290 00411
290 30411
291 00412
291 30412
292 00413
292 30413
293 00414
293 30414
294 00415
294 30415
295 00416
295 30416
296 00417
296 30417
297 00418
297 30418
298 00419
298 30419
299 00420
299 30420
300 00421
300 30421
301 00422
301 30422
302 00423
302 30423
303 00424
303 30424
304 00425
304 30425
305 00426
305 30426
306 00427
306 30427
307 00428
307 30428
308 00429
308 30429
309 00430
309 30430
310 00431
310 30431
311 00432
311 30432
312 00433
312 30433
313 00434
313 30434
314 00435
314 30435
315 00436
315 30436
316 00437
316 30437
317 00438
317 30438
318 00439
318 30439
319 00440
319 30440
320 00441
320 30441
321 00442
321 30442
322 00443
322 30443
323 00444
323 30444
324 00445
324 30445
325 00446
325 30446
326 00447
326 30447
327 00448
327 30448
328 00449
328 30449
329 00450
329 30450
330 00451
330 30451
331 00452
331 30452
332 00453
332 30453
333 00454
333 30454
334 00455
334 30455
335 00456
335 30456
336 00457
336 30457
337 00458
337 30458
338 00459
338 30459
339 00460
339 30460
340 00461
340 30461
341 00462
341 30462
342 00463
342 30463
343 00464
343 30464
344 00465
344 30465
345 00466
345 30466
346 00467
346 30467
347 00468
347 30468
348 00469
348 30469
349 00470
349 30470
350 00471
350 30471
351 00472
351 30472
352 00473
352 30473
353 00474
353 30474
354 00475
354 30475
355 00476
355 30476
356 00477
356 30477
357 00478
357 30478
358 00479
358 30479
359 00480
359 30480
360 00481
360 30481
361 00482
361 30482
362 00483
362 30483
363 00484
363 30484
364 00485
364 30485
365 00486
365 30486
366 00487
366 30487
367 00488
367 30488
368 00489
368 30489
369 00490
369 30490
370 00491
370 30491
371 00492
371 30492
372 00493
372 30493
373 00494
373 30494
374 00495
374 30495
375 00496
375 30496
376 00497
376 30497
377 00498
377 30498
378 00499
378 30499
379 00500
379 30500
380 00501
380 30501
381 00502
381 30502
382 00503
382 30503
383 00504
383 30504
384 00505
384 30505
385 00506
385 30506
386 00507
386 30507
387 00508
387 30508
388 00509
388 30509
389 00510
389 30510
390 00511
390 30511
391 00512
391 30512
392 00513
392 30513
393 00514
393 30514
394 00515
394 30515
395 00516
395 30516
396 00517
396 30517
397 00518
397 30518
398 00519
398 30519
399 00520
399 30520
400 00521
400 30521
401 00522
401 30522
402 00523
402 30523
403 00524
403 30524
404 00525
404 30525
405 00526
405 30526
406 00527
406 30527
407 00528
407 30528
408 00529
408 30529
409 00530
409 30530
410 00531
410 30531
411 00532
411 30532
412 00533
412 30533
413 00534
413 30534
414 00535
414 30535
415 00536
415 30536
416 00537
416 30537
417 00538
417 30538
418 00539
418 30539
419 00540
419 30540
420 00541
420 30541
421 00542
421 30542
422 00543
422 30543
423 00544
423 30544
424 00545
424 30545
425 00546
425 30546
426 00547
426 30547
427 00548
427 30548
428 00549
428 30549
429 00550
429 30550
430 00551
430 30551
431 00552
431 30552
432 00553
432 30553
433 00554
433 30554
434 00555
434 30555
435 00556
435 30556
436 00557
436 30557
437 00558
437 30558
438 00559
438 30559
439 00560
439 30560
440 00561
440 30561
441 00562
441 30562
442 00563
442 30563
443 00564
443 30564
444 00565
444 30565
445 00566
445 30566
446 00567
446 30567
447 00568
447 30568
448 00569
448 30569
449 00570
449 30570
450 00571
450 30571
451 00572
451 30572
452 00573
452 30573
453 00574
453 30574
454 00575
454 30575
455 00576
455 30576
456 00577
456 30577
457 00578
457 30578
458 00579
458 30579
459 00580
459 30580
460 00581
460 30581
461 00582
461 30582
462 00583
462 30583
463 00584
463 30584
464 00585
464 30585
465 00586
465 30586
466 00587
466 30587
467 00588
467 30588
468 00589
468 30589
469 00590
469 30590
470 00591
470 30591
471 00592
471 30592
472 00593
472 30593
473 00594
473 30594
474 00595
474 30595
475 00596
475 30596
476 00597
476 30597
477 00598
477 30598
478 00599
478 30599
479 00600
479 30600
480 00601
480 30601
481 00602
481 30602
482 00603
482 30603
483 00604
483 30604
484 00605
484 30605
485 00606
485 30606
486 00607
486 30607
487 00608
487 30608
488 00609
488 30609
489 00610
489 30610
490 00611
490 30611
491 00612
491 30612
492 00613
492 30613
493 00614
493 30614
494 00615
494 30615
495 00616
495 30616
496 00617
496 30617
497 00618
497 30618
498 00619
498 30619
499 00620
499 30620
500 00621
500 30621
501 00622
501 30622
502 00623
502 30623
503 00624
503 30624
504 00625
504 30625
505 00626
505 30626
506 00627
506 30627
507 00628
507 30628
508 00629
508 30629
509 00630
509 30630
51

FLAHERTY GIAYARA ASSOCIATES, P. C.

PAGE 0079

PEAK OUTFLOW 18	182.	AT TIME 44.00 HOURS	PEAK			6-HOUR 169. CFS	24-HOUR 99. CFS	72-HOUR 40. CFS	TOTAL VOLUME 4853. 137.
			CFS	CMS	INCHES				
1843.2	1843.2	1843.2	1843.2	1843.3	1843.3	1843.4	1843.5	1843.6	1843.8
1844.2	1844.2	1844.2	1844.2	1845.1	1845.1	1845.4	1845.5	1845.5	1845.4
1845.2	1845.2	1845.2	1845.2	1845.1	1845.0	1844.9	1844.9	1844.9	1844.7
1845.3	1845.3	1845.3	1845.2	1845.1	1844.9	1844.5	1844.4	1844.3	1844.3
1844.7	1844.7	1844.7	1844.6	1844.5	1844.5	1844.4	1844.4	1844.3	1844.1
1844.8	1844.8	1844.8	1844.7	1844.6	1844.6	1844.4	1844.4	1844.3	1844.1
1844.9	1844.9	1844.9	1844.8	1844.7	1844.7	1844.4	1844.4	1844.3	1844.1
1844.6	1844.6	1844.6	1844.5	1844.4	1844.4	1844.2	1844.2	1844.1	1844.1
1844.5	1844.5	1844.5	1844.4	1844.3	1844.2	1844.1	1844.1	1844.1	1844.1
1844.3	1844.3	1844.3	1844.2	1844.2	1844.2	1844.1	1844.1	1844.1	1844.1

QVF

100. 200. INFLOW(0) AND OUTFLOW(*)

300. 400. 500. 600.

C-92

FLAHERTY GIAVARA ASSOCIATES, P.C.

PAGE 0080

19.00 3801

19.30 401

20.30 411

20.30 421

20.30 431

20.30 441

20.30 451

20.30 461

20.30 471

20.30 481

20.30 491

20.30 501

20.30 511

20.30 521

20.30 531

20.30 541

20.30 551

20.30 561

20.30 571

20.30 581

20.30 591

20.30 601

20.30 611

20.30 621

20.30 631

20.30 641

20.30 651

20.30 661

20.30 671

20.30 681

20.30 691

20.30 701

20.30 711

20.30 721

20.30 731

20.30 741

20.30 751

20.30 761

20.30 771

20.30 781

20.30 791

20.30 801

20.30 811

20.30 821

20.30 831

20.30 841

20.30 851

20.30 861

20.30 871

20.30 881

20.30 891

20.30 901

20.30 911

20.30 921

20.30 931

20.30 941

20.30 951

20.30 961

20.30 971

20.30 981

20.30 991

20.30 001

20.30 011

20.30 021

20.30 031

20.30 041

20.30 051

20.30 061

20.30 071

20.30 081

20.30 091

20.30 101

20.30 111

20.30 121

20.30 131

20.30 141

20.30 151

20.30 161

20.30 171

20.30 181

20.30 191

20.30 201

20.30 211

20.30 221

20.30 231

20.30 241

20.30 251

20.30 261

20.30 271

20.30 281

20.30 291

20.30 301

20.30 311

20.30 321

20.30 331

20.30 341

20.30 351

20.30 361

20.30 371

20.30 381

20.30 391

20.30 401

20.30 411

20.30 421

20.30 431

20.30 441

20.30 451

20.30 461

20.30 471

20.30 481

20.30 491

20.30 501

20.30 511

20.30 521

20.30 531

20.30 541

20.30 551

20.30 561

20.30 571

20.30 581

20.30 591

20.30 601

20.30 611

20.30 621

20.30 631

20.30 641

20.30 651

20.30 661

20.30 671

20.30 681

20.30 691

20.30 701

20.30 711

20.30 721

20.30 731

20.30 741

20.30 751

20.30 761

20.30 771

20.30 781

20.30 791

20.30 801

20.30 811

20.30 821

20.30 831

20.30 841

20.30 851

20.30 861

20.30 871

20.30 881

20.30 891

20.30 901

20.30 911

20.30 921

20.30 931

20.30 941

20.30 951

20.30 961

20.30 971

20.30 981

20.30 991

20.30 001

20.30 011

20.30 021

20.30 031

20.30 041

20.30 051

20.30 061

20.30 071

20.30 081

20.30 091

20.30 101

20.30 111

20.30 121

20.30 131

20.30 141

20.30 151

20.30 161

20.30 171

20.30 181

20.30 191

20.30 201

20.30 211

20.30 221

20.30 231

20.30 241

20.30 251

20.30 261

20.30 271

20.30 281

20.30 291

20.30 301

20.30 311

20.30 321

20.30 331

20.30 341

20.30 351

20.30 361

20.30 371

20.30 381

20.30 391

20.30 401

20.30 411

20.30 421

20.30 431

20.30 441

20.30 451

20.30 461

20.30 471

20.30 481

20.30 491

20.30 501

20.30 511

20.30 521

20.30 531

20.30 541

20.30 551

20.30 561

20.30 571

20.30 581

20.30 591

20.30 601

20.30 611

20.30 621

20.30 631

20.30 641

20.30 651

20.30 661

20.30 671

20.30 681

20.30 691

20.30 701

20.30 711

20.30 721

20.30 731

20.30 741

20.30 751

20.30 761

20.30 771

20.30 781

20.30 791

20.30 801

20.30 811

20.30 821

20.30 831

20.30 841

20.30 851

20.30 861

20.30 871

20.30 881

20.30 891

20.30 901

20.30 911

20.30 921

20.30 931

20.30 941

20.30 951

20.30 961

20.30 971

20.30 981

20.30 991

20.30 001

20.30 011

20.30 021

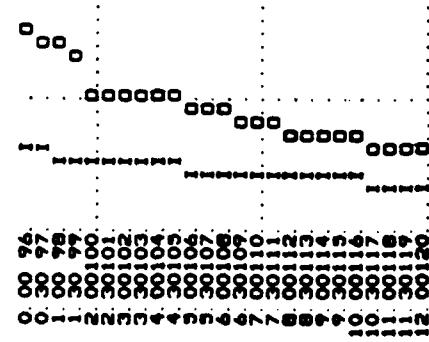
20.30 031

20.30 041

20.30 051

FLAHERTY & GAYARA ASSOCIATES, P. C.

PAGE 0081



15

**STATION 2, PLAN 1. RATIO 4
END-OF-PERIOD HYDROGRAPH ORDINATES**

卷之三

30

1

१

5

6

•

4

8

1

3

1

1

०

8

1

1

EL AMERTY ALAWARA ASSOCIATES, P.C.

PAGE 00B2

REVIEWS OF BOOKS

TIME	24-HOUR			TOTAL VOLUME
	PEAK	6-HOUR	72-HOUR	
GFS	207	185.	45.	5379.
CMS	6.	5.	3.	192.
INCHES				0.94
MM				0.94
AC-F1				113.
THOUS CU M				269.

卷之三

C-95

FLAHERTY CLAVARA ASSOCIATES, P. C.

PAGE 0083

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0084

Lc-97

STATION 2. PLAN 1. RATIO 3

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0083

67.		0000000000000000	100 64 144 102 77 61
68.		0000000000000000	148 106 178 62
69.		0000000000000000	1520 110 80 63
70.		0000000000000000	3032 182 182 65
71.		0000000000000000	2508 184 66
72.	STORAGE	0000233346464646	1508 112 88 68
73.		0000100000000000	129 126 67
74.		0000000000000000	1120 1120 71
75.		0000000000000000	1300 1300 70
76.		0000000000000000	17400000

PREMIUM QUALITY FLOW IN
250g. AT TIME 43.30 hours

PEAK
255
7

CFS	CMH	INCHES	MM	AC-FT	THOUS CU M

DRAFT

10118

200. INFLOW (1), CUTOFF (2) AND OBSERVED FLOW (**).
300. 400. 500. 600. 700.

卷之三

卷之三

卷之三

卷之三

卷之三

卷之三

卷之三

THE BOSTONIAN 167

C-98

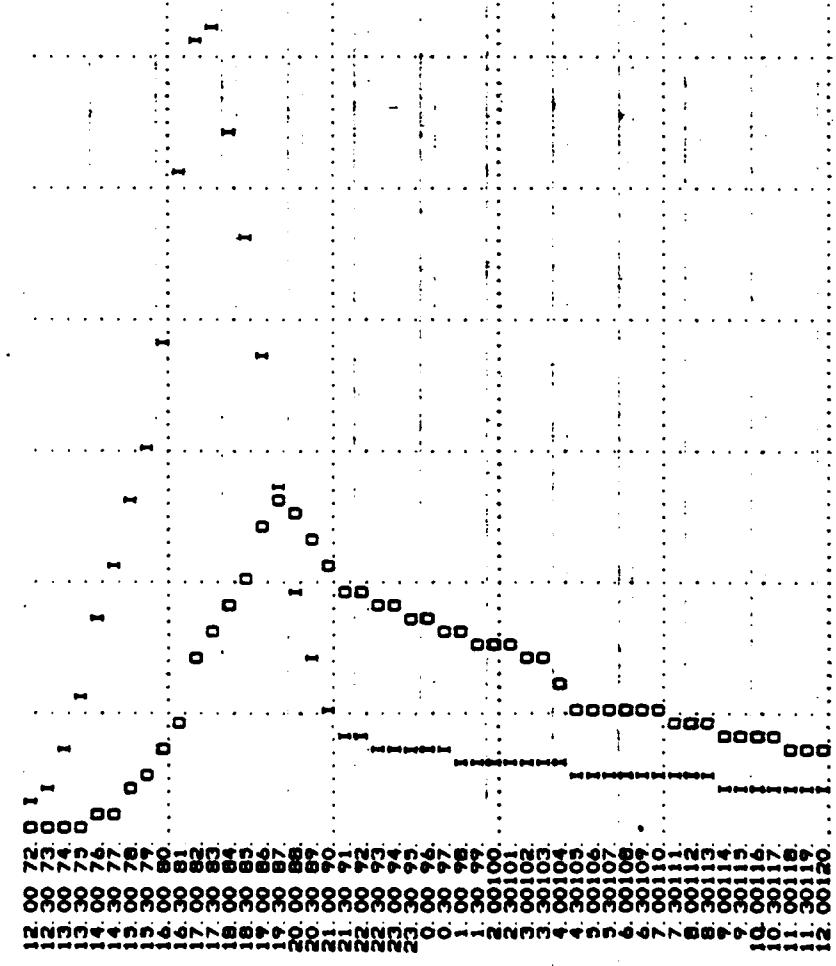
FLAHERTY & AVARIA ASSOCIATES, P. C.

PACE 00B6

778899100-112233445566778818191720212223242526272829200-112233445566778899100-11

FLAHERTY GIAVARA ASSOCIATES, P.C.

PAGE 0087



END-OF-PERIOD

STATION 2, PLAN 1, RATIO 6
END-OF-PERIOD HYDROGRAPH ORDINATES

C-101

FLAHERTY GIavarA ASSOCIATES, P. C.

PAGE 0089

2004-06-17 08:01-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00
2004-06-17 08:00-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00
2004-06-17 08:00-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00 2004-06-17 08:00-11:15 17:18:00-18:45:00

C-102

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0090

C-103

FLAHERTY GIavarA ASSOCIATES, P. C.

PAGE 0092

P*	STATION	INFLOW(1), OUTFLOW(0) AND OBSERVED FLOW(*)		1000 1200
		20. INCHES MM AC-FT THOUS CU M	13. 0.97 24.54 229. 283.	
P*	200.	400.	0.	0.
	101.			
	102.			
	103.			
	104.			
	105.			
	106.			
	107.			
	108.			
	109.			
	110.			
	111.			
	112.			
	113.			
	114.			
	115.			
	116.			
	117.			
	118.			
	119.			
	120.			
	121.			
	122.			
	123.			
	124.			
	125.			
	126.			
	127.			
	128.			
	129.			
	130.			
	131.			
	132.			
	133.			
	134.			
	135.			
	136.			
	137.			
	138.			
	139.			
	140.			
	141.			
	142.			
	143.			
	144.			
	145.			
	146.			
	147.			
	148.			
	149.			
	150.			
	151.			
	152.			
	153.			
	154.			
	155.			
	156.			
	157.			
	158.			
	159.			
	160.			
	161.			
	162.			
	163.			
	164.			
	165.			
	166.			
	167.			
	168.			
	169.			
	170.			
	171.			
	172.			
	173.			
	174.			
	175.			
	176.			
	177.			
	178.			
	179.			
	180.			
	181.			
	182.			
	183.			
	184.			
	185.			
	186.			
	187.			
	188.			
	189.			
	190.			
	191.			
	192.			
	193.			
	194.			
	195.			
	196.			
	197.			
	198.			
	199.			
	200.			
	201.			
	202.			
	203.			
	204.			
	205.			
	206.			
	207.			
	208.			
	209.			
	210.			
	211.			
	212.			
	213.			
	214.			
	215.			
	216.			
	217.			
	218.			
	219.			
	220.			
	221.			
	222.			
	223.			
	224.			
	225.			
	226.			
	227.			
	228.			
	229.			
	230.			
	231.			
	232.			
	233.			
	234.			
	235.			
	236.			
	237.			
	238.			
	239.			
	240.			
	241.			
	242.			
	243.			
	244.			
	245.			
	246.			
	247.			
	248.			
	249.			
	250.			
	251.			
	252.			
	253.			
	254.			
	255.			
	256.			
	257.			
	258.			
	259.			
	260.			
	261.			
	262.			
	263.			
	264.			
	265.			
	266.			
	267.			
	268.			
	269.			
	270.			
	271.			
	272.			
	273.			
	274.			
	275.			
	276.			
	277.			
	278.			
	279.			
	280.			
	281.			
	282.			
	283.			
	284.			
	285.			
	286.			
	287.			
	288.			
	289.			
	290.			
	291.			
	292.			
	293.			
	294.			
	295.			
	296.			
	297.			
	298.			
	299.			
	300.			
	301.			
	302.			
	303.			
	304.			
	305.			
	306.			
	307.			
	308.			
	309.			
	310.			
	311.			
	312.			
	313.			
	314.			
	315.			
	316.			
	317.			
	318.			
	319.			
	320.			
	321.			
	322.			
	323.			
	324.			
	325.			
	326.			
	327.			
	328.			
	329.			
	330.			
	331.			
	332.			
	333.			
	334.			
	335.			
	336.			
	337.			
	338.			
	339.			
	340.			
	341.			
	342.			
	343.			
	344.			
	345.			
	346.			
	347.			
	348.			
	349.			
	350.			
	351.			
	352.			
	353.			
	354.			
	355.			
	356.			
	357.			
	358.			
	359.			
	360.			
	361.			
	362.			
	363.			
	364.			
	365.			
	366.			
	367.			
	368.			
	369.			
	370.			
	371.			
	372.			
	373.			
	374.			
	375.			
	376.			
	377.			
	378.			
	379.			
	380.			
	381.			
	382.			
	383.			
	384.			
	385.			
	386.			
	387.			
	388.			
	389.			
	390.			
	391.			
	392.			
	393.			
	394.			
	395.			
	396.			
	397.			
	398.			
	399.			
	400.			
	401.			
	402.			
	403.			
	404.			
	405.			
	406.			
	407.			
	408.			
	409.			
	410.			
	411.			
	412.			
	413.			
	414.			
	415.			
	416.			
	417.			
	418.			
	419.			
	420.			
	421.			
	422.			
	423.			
	424.			
	425.			
	426.			
	427.			
	428.			
	429.			
	430.			
	431.			
	432.			
	433.			
	434.			
	435.			
	436.			
	437.			
	438.			
	439.			
	440.			
	441.			
	442.			
	443.			
	444.			
	445.			
	446.			
	447.			

FLAHERTY OLIVARA ASSOCIATES, P. C.

PRO 3040 E400

t-106

FLAHERTY & LAVARVA ASSOCIATES, P. C.

PAGE 0094 ***

010700890-1234567890
003000000000000000000000
000000000000000000000000
000000000000000000000000

卷之三

C-107

STATION 2: PLAN 1, RATIO 8:1

FLAHERTY GIavarA ASSOCIATES, P. C.

PAGE 0075

	PEAK DUTTLOW 18	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3	1843.3
1843.3	1843.3	1843.3	1843.4	1843.5	1843.5	1843.7	1843.8
1843.4	1843.4	1844.0	1844.1	1844.4	1844.7	1845.2	1845.7
1843.7	1843.7	1846.1	1846.6	1848.7	1849.6	1849.1	1847.3
1847.5	1846.5	1846.4	1846.3	1846.2	1846.1	1846.1	1846.0
1846.7	1846.9	1846.4	1845.9	1845.9	1845.9	1845.8	1845.8
1845.9	1845.7	1845.9	1845.7	1845.7	1845.7	1845.6	1845.6
1845.8	1845.7	1845.7	1845.7	1845.7	1845.7	1845.6	1845.6

2242. AT TIME 42.00 HOURS

CFS	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL	VOLUME
CMS	2242	1471	357	227	27299	
INCHES	63	4.2	1.6	0.7	773	
MM						
AC-FT						
THOUS CU M						

DWF

STATION 2

AND OBSERVED FLOW(1)

2000. 1600.

2400. 2800.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0. 0.

0.11
0.12
0.13
0.14
0.15
0.16
0.17
0.18
0.19
0.20
0.21
0.22
0.23
0.24
0.25
0.26
0.27
0.28
0.29
0.30
0.31
0.32
0.33
0.34
0.35
0.36
0.37
0.38
0.39
0.40
0.41
0.42
0.43
0.44
0.45
0.46
0.47
0.48
0.49
0.50
0.51
0.52
0.53
0.54
0.55
0.56
0.57
0.58
0.59
0.60
0.61
0.62
0.63
0.64
0.65
0.66
0.67
0.68
0.69
0.70
0.71
0.72
0.73
0.74
0.75
0.76
0.77
0.78
0.79
0.80
0.81
0.82
0.83
0.84
0.85
0.86
0.87
0.88
0.89
0.90
0.91
0.92
0.93
0.94
0.95
0.96
0.97
0.98
0.99
1.00
1.01
1.02
1.03
1.04
1.05
1.06
1.07
1.08
1.09
1.10
1.11
1.12
1.13
1.14
1.15
1.16
1.17
1.18
1.19
1.20
1.21
1.22
1.23
1.24
1.25
1.26
1.27
1.28
1.29
1.30
1.31
1.32
1.33
1.34
1.35
1.36
1.37
1.38
1.39
1.40
1.41
1.42
1.43
1.44
1.45
1.46
1.47
1.48
1.49
1.50
1.51
1.52
1.53
1.54
1.55
1.56
1.57
1.58
1.59
1.60
1.61
1.62
1.63
1.64
1.65
1.66
1.67
1.68
1.69
1.70
1.71
1.72
1.73
1.74
1.75
1.76
1.77
1.78
1.79
1.80
1.81
1.82
1.83
1.84
1.85
1.86
1.87
1.88
1.89
1.90
1.91
1.92
1.93
1.94
1.95
1.96
1.97
1.98
1.99
2.00
2.01
2.02
2.03
2.04
2.05
2.06
2.07
2.08
2.09
2.10
2.11
2.12
2.13
2.14
2.15
2.16
2.17
2.18
2.19
2.20
2.21
2.22
2.23
2.24
2.25
2.26
2.27
2.28
2.29
2.30
2.31
2.32
2.33
2.34
2.35
2.36
2.37
2.38
2.39
2.40
2.41
2.42
2.43
2.44
2.45
2.46
2.47
2.48
2.49
2.50
2.51
2.52
2.53
2.54
2.55
2.56
2.57
2.58
2.59
2.60
2.61
2.62
2.63
2.64
2.65
2.66
2.67
2.68
2.69
2.70
2.71
2.72
2.73
2.74
2.75
2.76
2.77
2.78
2.79
2.80
2.81
2.82
2.83
2.84
2.85
2.86
2.87
2.88
2.89
2.90
2.91
2.92
2.93
2.94
2.95
2.96
2.97
2.98
2.99
3.00
3.01
3.02
3.03
3.04
3.05
3.06
3.07
3.08
3.09
3.10
3.11
3.12
3.13
3.14
3.15
3.16
3.17
3.18
3.19
3.20
3.21
3.22
3.23
3.24
3.25
3.26
3.27
3.28
3.29
3.30
3.31
3.32
3.33
3.34
3.35
3.36
3.37
3.38
3.39
3.40
3.41
3.42
3.43
3.44
3.45
3.46
3.47
3.48
3.49
3.50
3.51
3.52
3.53
3.54
3.55
3.56
3.57
3.58
3.59
3.60
3.61
3.62
3.63
3.64
3.65
3.66
3.67
3.68
3.69
3.70
3.71
3.72
3.73
3.74
3.75
3.76
3.77
3.78
3.79
3.80
3.81
3.82
3.83
3.84
3.85
3.86
3.87
3.88
3.89
3.90
3.91
3.92
3.93
3.94
3.95
3.96
3.97
3.98
3.99
4.00
4.01
4.02
4.03
4.04
4.05
4.06
4.07
4.08
4.09
4.10
4.11
4.12
4.13
4.14
4.15
4.16
4.17
4.18
4.19
4.20
4.21
4.22
4.23
4.24
4.25
4.26
4.27
4.28
4.29
4.30
4.31
4.32
4.33
4.34
4.35
4.36
4.37
4.38
4.39
4.40
4.41
4.42
4.43
4.44
4.45
4.46
4.47
4.48
4.49
4.50
4.51
4.52
4.53
4.54
4.55
4.56
4.57
4.58
4.59
4.60
4.61
4.62
4.63
4.64
4.65
4.66
4.67
4.68
4.69
4.70
4.71
4.72
4.73
4.74
4.75
4.76
4.77
4.78
4.79
4.80
4.81
4.82
4.83
4.84
4.85
4.86
4.87
4.88
4.89
4.90
4.91
4.92
4.93
4.94
4.95
4.96
4.97
4.98
4.99
5.00
5.01
5.02
5.03
5.04
5.05
5.06
5.07
5.08
5.09
5.10
5.11
5.12
5.13
5.14
5.15
5.16
5.17
5.18
5.19
5.20
5.21
5.22
5.23
5.24
5.25
5.26
5.27
5.28
5.29
5.30
5.31
5.32
5.33
5.34
5.35
5.36
5.37
5.38
5.39
5.40
5.41
5.42
5.43
5.44
5.45
5.46
5.47
5.48
5.49
5.50
5.51
5.52
5.53
5.54
5.55
5.56
5.57
5.58
5.59
5.60
5.61
5.62
5.63
5.64
5.65
5.66
5.67
5.68
5.69
5.70
5.71
5.72
5.73
5.74
5.75
5.76
5.77
5.78
5.79
5.80
5.81
5.82
5.83
5.84
5.85
5.86
5.87
5.88
5.89
5.90
5.91
5.92
5.93
5.94
5.95
5.96
5.97
5.98
5.99
6.00
6.01
6.02
6.03
6.04
6.05
6.06
6.07
6.08
6.09
6.10
6.11
6.12
6.13
6.14
6.15
6.16
6.17
6.18
6.19
6.20
6.21
6.22
6.23
6.24
6.25
6.26
6.27
6.28
6.29
6.30
6.31
6.32
6.33
6.34
6.35
6.36
6.37
6.38
6.39
6.40
6.41
6.42
6.43
6.44
6.45
6.46
6.47
6.48
6.49
6.50
6.51
6.52
6.53
6.54
6.55
6.56
6.57
6.58
6.59
6.60
6.61
6.62
6.63
6.64
6.65
6.66
6.67
6.68
6.69
6.70
6.71
6.72
6.73
6.74
6.75
6.76
6.77
6.78
6.79
6.80
6.81
6.82
6.83
6.84
6.85
6.86
6.87
6.88
6.89
6.90
6.91
6.92
6.93
6.94
6.95
6.96
6.97
6.98
6.99
7.00
7.01
7.02
7.03
7.04
7.05
7.06
7.07
7.08
7.09
7.10
7.11
7.12
7.13
7.14
7.15
7.16
7.17
7.18
7.19
7.20
7.21
7.22
7.23
7.24
7.25
7.26
7.27
7.28
7.29
7.30
7.31
7.32
7.33
7.34
7.35
7.36
7.37
7.38
7.39
7.40
7.41
7.42
7.43
7.44
7.45
7.46
7.47
7.48
7.49
7.50
7.51
7.52
7.53
7.54
7.55
7.56
7.57
7.58
7.59
7.60
7.61
7.62
7.63
7.64
7.65
7.66
7.67
7.68
7.69
7.70
7.71
7.72
7.73
7.74
7.75
7.76
7.77
7.78
7.79
7.80
7.81
7.82
7.83
7.84
7.85
7.86
7.87
7.88
7.89
7.90
7.91
7.92
7.93
7.94
7.95
7.96
7.97
7.98
7.99
8.00
8.01
8.02
8.03
8.04
8.05
8.06
8.07
8.08
8.09
8.10
8.11
8.12
8.13
8.14
8.15
8.16
8.17
8.18
8.19
8.20
8.21
8.22
8.23
8.24
8.25
8.26
8.27
8.28
8.29
8.30
8.31
8.32
8.33
8.34
8.35
8.36
8.37
8.38
8.39
8.40
8.41
8.42
8.43
8.44
8.45
8.46
8.47
8.48
8.49
8.50
8.51
8.52
8.53
8.54
8.55
8.56
8.57
8.58
8.59
8.60
8.61
8.62
8.63
8.64
8.65
8.66
8.67
8.68
8.69
8.70
8.71
8.72
8.73
8.74
8.75
8.76
8.77
8.78
8.79
8.80
8.81
8.82
8.83
8.84
8.85
8.86
8.87
8.88
8.89
8.90
8.91
8.92
8.93
8.94
8.95
8.96
8.97
8.98
8.99
9.00
9.01
9.02
9.03
9.04
9.05
9.06
9.07
9.08
9.09
9.10
9.11
9.12
9.13
9.14
9.15
9.16
9.17
9.18
9.19
9.20
9.21
9.22
9.23
9.24
9.25
9.26
9.27
9.28
9.29
9.30
9.31
9.32
9.33
9.34
9.35
9.36
9.37
9.38
9.39
9.40
9.41
9.42
9.43
9.44
9.45
9.46
9.47
9.48
9.49
9.50
9.51
9.52
9.53
9.54
9.55
9.56
9.57
9.58
9.59
9.60
9.61
9.62
9.63
9.64
9.65
9.66
9.67
9.68
9.69
9.70
9.71
9.72
9.73
9.74
9.75
9.76
9.77
9.78
9.79
9.80
9.81
9.82
9.83
9.84
9.85
9.86
9.87
9.88
9.89
9.90
9.91
9.92
9.93
9.94
9.95
9.96
9.97
9.98
9.99
10.00

FLAHERTY & AVARA ASSOCIATES, P. C.

PAGE 0096

FLAHERTY CLAVARA ASSOCIATES, P. C.

PAGE 0097

11

C-110

**STATION — 21, PLAN 1, RATIO 4
END-OF-PERIOD HYDROGRAPH ORDINATES**

၁၈၇

ONLINE
BOOKS

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0098

PEAK OUTFLOW IS 4687 AT TIME 42.00 HOURS

卷之三

INFLOW(I), OUTFLOW(O) AND OBSERVED FLOW(*)

०
०
०

WED FLOW (*)
6000.

BRIEF
AND OBSERVATION
3000.

-04101

OUTFLUX

INFLOW 36

1000

०

FLAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0099

c-i12

FLAMERTY & IAVARA ASSOCIATES, P. C.

PAGE 0100

100

1

卷之三

卷之三

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS

OPERATION	STATION	AREA	PLAN	RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIO 7	RATIO 8	RATIO 9	RATIO 10	RATIO 11	RATIO 12	RATIO 13	RATIO 14	RATIO 15	RATIO 16	RATIO 17	RATIO 18	RATIO 19	RATIO 20	RATIO 21	RATIO 22	RATIO 23	RATIO 24	RATIO 25	RATIO 26	RATIO 27	RATIO 28	RATIO 29	RATIO 30	RATIO 31	RATIO 32	RATIO 33	RATIO 34	RATIO 35	RATIO 36	RATIO 37	RATIO 38	RATIO 39	RATIO 40	RATIO 41	RATIO 42	RATIO 43	RATIO 44	RATIO 45	RATIO 46	RATIO 47	RATIO 48	RATIO 49	RATIO 50	RATIO 51	RATIO 52	RATIO 53	RATIO 54	RATIO 55	RATIO 56	RATIO 57	RATIO 58	RATIO 59	RATIO 60	RATIO 61	RATIO 62	RATIO 63	RATIO 64	RATIO 65	RATIO 66	RATIO 67	RATIO 68	RATIO 69	RATIO 70	RATIO 71	RATIO 72	RATIO 73	RATIO 74	RATIO 75	RATIO 76	RATIO 77	RATIO 78	RATIO 79	RATIO 80	RATIO 81	RATIO 82	RATIO 83	RATIO 84	RATIO 85	RATIO 86	RATIO 87	RATIO 88	RATIO 89	RATIO 90	RATIO 91	RATIO 92	RATIO 93	RATIO 94	RATIO 95	RATIO 96	RATIO 97	RATIO 98	RATIO 99	RATIO 100
-----------	---------	------	------	---------	---------	---------	---------	---------	---------	---------	---------	---------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------	-----------

ELAHERTY CIAVARA ASSOCIATES, P. C.

PAGE 0101

HYDROGRAPH AT ROUTED TO		INITIAL VALUE 1956.00	SPILLWAY CREST 1956.00	TOP OF DAM 1972.80	TIME OF FAILURE HOURS 271.
1. 2.37 6.66)	1. (328) 9.71)(	590. 16.71)(	636. 18.56)(	721. 20.42)(	787. 22.27)(
1. 2.37 6.66)	1. (9. 0.25)(	16. 0.44)(	17. 0.49)(	17. 0.54)(	21. 0.58)(
2. 1.88 4.87)	1. (253) 7.15)(	455. 12.88)(	505. 14.31)(	556. 15.74)(	606. 17.17)(
2 COMBINED	1. (257) 7.28)(	463. 13.10)(	514. 14.56)(	565. 16.01)(	617. 17.47)(
ROUTED TO	1. (11.53) 11.53)	1.68. 4.77)(	182. 3.14)(	207. 5.86)(	255. 7.23)(
SUMMARY OF DAM SAFETY ANALYSIS					
PLAN 1		ELEVATION STORAGE OUTFLOW	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS
RATIO OF PIPE W.S. ELEV	W.S. ELEV	OVER DAM	OVER	OVER	OVER
0.05	1956.87	0.00	139.	7.	0.00
0.09	1957.96	0.00	252.	16.	0.00
0.10	1957.73	0.00	280.	17.	0.00
0.11	1957.90	0.00	308.	19.	0.00
0.12	1958.06	0.00	337.	21.	0.00
0.13	1958.23	0.00	365.	22.	0.00
0.20	1959.36	0.00	563.	34.	0.00
0.30	1963.84	0.00	1421.	88.	0.00
0.50	1969.91	0.00	2748.	224.	0.00
SUMMARY OF DAM SAFETY ANALYSIS					
PLAN 1		ELEVATION STORAGE OUTFLOW	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS
RATIO OF PIPE W.S. ELEV	W.S. ELEV	OVER DAM	OVER	OVER	OVER
0.05	1844.35	0.00	67.	63	0.00
0.09	1845.25	0.00	118.	168	0.00
0.10	1845.18	0.00	130.	182	0.00
0.11	1845.11	0.00	143.	207	0.00
0.12	1845.08	0.00	153.	255	0.00
0.13	1846.04	0.00	161.	312	0.00
0.20	1846.78	0.00	164.	691	0.00
0.30	1848.12	0.00	172.	730	0.00
0.50	1850.93	0.00	223.	221	0.00
SUMMARY OF DAM SAFETY ANALYSIS					
PLAN 1		ELEVATION STORAGE OUTFLOW	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS
RATIO OF PIPE W.S. ELEV	W.S. ELEV	OVER DAM	OVER	OVER	OVER
0.05	1844.35	0.00	67.	63	0.00
0.09	1845.25	0.00	118.	168	0.00
0.10	1845.18	0.00	130.	182	0.00
0.11	1845.11	0.00	143.	207	0.00
0.12	1845.08	0.00	153.	255	0.00
0.13	1846.04	0.00	161.	312	0.00
0.20	1846.78	0.00	164.	691	0.00
0.30	1848.12	0.00	172.	730	0.00
0.50	1850.93	0.00	223.	221	0.00

FLAHERTY GIAVARA ASSOCIATES, P.C.

PAGE '0102'

FLOOD HYDROGRAPH PACKAGE (HEC-1)
JULY 1978
DAM SAFETY VERSION
LAST MODIFICATION 26 FEB 79

C-115

APPENDIX D

PREVIOUS INSPECTION REPORTS/AVAILABLE DOCUMENTS

DAM CONSTRUCTION PERMIT APPLICATION

OFFICE STATE ENGINEER
JAN 22 1924
SFD 10Received Jan 22nd 1924 Dam No. 413 Delaware WatershedDisposition Approved Feb 2nd 1924 Serial No. 548

Site inspected _____

Foundation inspected _____

Structure inspected _____

Application for the Construction or Reconstruction of a Dam

Application is hereby made to the State Engineer, Albany, N. Y., in compliance with the provisions of Chapter LXV of the Consolidated Laws and Chapter 647, Laws of 1911, Section 22 as amended, for the approval of specifications and detailed plans, marked.

herewith submitted for the {construction} {reconstruction} of a dam located as stated below. All provisions of law will be complied with in the erection of the proposed dam.

1. The dam will be on Trout Brook branch of Beaverkill River in the town of Fremont, County of Sullivan and Mouth of stream at Peckville Seven miles due north

(Give exact distance and direction from a well-known bridge, dam, village, main cross-roads or mouth of a stream)

2. The name and address of the owner is A. Folcomb; R. Graham; J. Kutzgar & C. Moore Rose

3. The dam will be used for Fishing and recreation

4. Will any part of the dam be built upon or its pond flood any State lands? No

5. The watershed at the proposed dam draining into the pond to be formed thereby is 1/4 square miles.

6. The proposed dam will have a pond area at the spillcrest elevation of 100+ acres and will impound 3 cubic feet of water.

7. The lowest part of the natural shore of the pond is 10 feet vertically above the spillcrest, and everywhere else the shore will be at least 10 feet above the spillcrest.

8. The maximum known flow of the stream at the dam site was cubic feet per second on (Date)

9. State if any damage to life or to any buildings, roads or other property could be caused by any possible failure of the proposed dam. No

10. The natural material of the bed on which the proposed dam will rest is (clay, sand, gravel, boulders, granite, shale, slate, limestone, etc.) Clay on surface with hard pan about 2 ft

11. The material of the right bank, in the direction with the current, is sand; at the spillcrest elevation this material has a top slope of 6 inches vertical to a foot horizontal on the center line of the dam, a vertical thickness at this elevation of 20 feet, and the top surface extends for a vertical height of 6 feet above the spillcrest.

12. The material of the left bank is sand; has a top slope of 3 inches to a foot horizontal, a thickness of 18 feet, and a height of 20 feet.

13. State the character of the bed and the banks in respect to the hardness, perviousness, water bearing, effect of exposure to air and to water, uniformity, etc. Substance is hard and practically impervious

14. If the bed is in layers, are the layers horizontal or inclined? If inclined what is the direction of the slope relative to the center line of the dam and the inches vertical to a foot horizontal?

15. What is the thickness of the layers?

16. Are there any porous seams or fissures?

17. WASTES. The spillway of the above proposed dam will be 20 ft feet long in the clear; the waters will be held at the right end by a Concrete Wall, the top of which will be 3 feet above the spillcrest, and have a top width of 2 feet; and at the left end by a Concrete wall, the top of which will be 3 feet above the spillcrest, and have a top width of 2 feet.

18. There will be also for flood discharge a pipe 24 inches in diameter and the bottom will be 10 feet below the spillcrest, a sluice or gate 8 feet wide in the clear by 8 feet high, and the bottom will be 10 feet below the spillcrest.

19. APRON. Below the proposed dam there will be an apron built of flat rocks and concrete feet long, 18 feet wide and 3 feet thick. The downstream side of the apron will have a thickness of 3 feet for a width of 15 feet.

20. PLANS. Each application for a permit of a dam over 12 feet in height must be accompanied by a location map and complete working drawings of the proposed structure. Each drawing should have a title giving the parts shown, the name of the town and county in which the dam site is located, and the name of the owner and of the engineer.

The location map (U. S. Geological Quadrangle or other map) should show the exact location of the proposed dam; of buildings below the dam which might be damaged by any failure of the dam; of roads adjacent to or crossing the stream below the dam, giving the lowest elevation of the roadway above the stream bed and giving the shape, the height and the width of stream openings; and of any embankments or steep slopes that any flood could pass over. Also indicate the character and use made of the ground.

The complete working drawings should give all the dimensions necessary for the calculations of the stability of the structure, and all the information asked for below under "Sketches." There may be attached to the plans any written reports, calculations, investigations or opinions that may aid in showing the data and method used by the designer.

21. SKETCHES. For small and unimportant structures, if plans have not been made, on the back sheet of this application make a sketch to scale for each different cross-section at the highest point; showing the height and the depth from the surface of the foundation, the bottom width, the top width (for a concrete or masonry spill at 18 inches below the crest), the elevation of the top in reference to the spillcrest, the length of the section, and the material of which the section is to be constructed. Mark each section with a capital letter. Also sketch a plan; show the above sections by their top lines, giving the mark and the length of each; the openings by their horizontal dimensions; and the abutments by their top width and top lengths from the upstream face of the spillcrest and give the elevation of the top in reference to the spillcrest.

22. ELEVATIONS. Also give the elevations, if possible from the Mean Sea Level, of at least two permanent Bench Marks; of the spillcrest for any existing dam on the proposed dam site, at the middle and at both ends of the spill; and of the spillcrest for the above proposed dam.

23. SAMPLES. When so instructed, send samples of the materials to be used in the construction of the proposed dam, using shipping tags which will be furnished. For sand one-half a cubic foot is desired; for cement, three pints; and for the natural bed, twenty cubic inches.

24. INSPECTION. State how inspection is to be provided for during construction.

*a licensed engineer before construction, when foundation
is in and at completion. Will consult*

PREVIOUS REPORTS



STATE OF NEW YORK
STATE ENGINEER AND SURVEYOR
ALBANY

ADDRESS ALL COMMUNICATIONS TO
DWIGHT B. LADU, STATE ENGINEER

Dam 413, Delaware,
Roscoe.

August 27, 1924.

Mr. E. D. Hendricks,
Division Engineer,
Albany, N. Y.

Dear Sir:

Mr. R. D. Graham is building a dam southwest of Roscoe on the outlet of Tennenah Lake, U. S. G. S. Sheet 147, and more than a mile below the lake.

The dam will be 20' wide and composed of an upstream and a downstream wall and stone filled between. The upstream wall is a 6' stone wall with a concrete wall in front 2' thick on top and 3' thick on the bottom and runs 18" into the bed. The downstream wall is 3' thick. The spillway is 20' long by 3' deep and 10' above the ground.

When in the vicinity of this dam will you please make an inspection of this work? The construction work has just commenced.

Very truly yours,

Dwight B. LaDu,
State Engineer,

By Arnold G. Chapman
Deputy State Engineer.

ARMCK/F.

PREVIOUS INSPECTION REPORTS

SEARCHED

REPORT ON DAM NO. 413 (Delaware)

Dam No. 413 R.D.Graham
Town of Freemont, Sullivan County.

New dam. Completed.
Construction Approved.

Topog. Sheet #147
Livingston Manor Quad.

July 28, 1925.

I inspected dam #413 on July 9, 1925. Mr. Graham was not at home but I talked with a young man who was staying at Mr. Graham's during the construction of the dam. The concrete wall on the upstream face has a top width of one foot and the top of the wall was about eleven feet above the bed of the stream. The young man told me that the bottom width was about three feet, that the bottom rested upon hardpan and was from three to six feet below the original ^{ground} surface. The wall was carried well into the banks to act as cut-offs and was about 150 feet long. The downstream wall was dry masonry and it was stone fill between the walls. The top width of the dam was about seventeen feet.

The spillway section and apron were about as shown by sketches on application. The apron extended for about six feet below the dam. It was rip-rap covered over with cement mortar. Instead of the two foot drain pipe, they placed a hemlock box about 18" square with a plank gate at the upstream end. It would be well to learn if this box is encased in concrete. I could see no seepage whatsoever thru or around the dam. The downstream dry wall looked none too good and may, in time, have to be relayed.

The drainage area is about 4½ sq. mi. and the pond floods about 100 acres. Lake Tannanah on the same stream and about one mile up stream floods over 200 acres.

*George D. Kelly
Asst Engr.*

PREVIOUS REPORTS

Lake Muskoday
Roscoe, N. Y. 12776
Sept. 15, 1975

RECEIVED

Mr. George A. Danskin, Local Permit Agent
Dept. Environmental Conservation
21 S. Putt Corners Rd.
New Paltz, N. Y.

SEP 16 1975
R. J. COOK, UNIT
New York State Department of
Environmental Conservation
REGION #3

Dear Mr. Danskin:

The Lake Muskoday Bungalow Colony Inc. wants to do some reinforcing work below our dam which is located on the headwaters of Trout Brook, Town of Fremont, Sullivan Co., about 2 miles below Tennannah Lake, and is listed as Dam 413 Delaware Watershed.

I called your office while you were on vacation and spoke to Mr. ~~William E. Stridle~~ explaining that we wanted to bring in rock fill to place below the dam for extra reinforcement and to make a rip-rap and stone masonry extension out from the existing spillway so the overflow will be a gradual flow instead of the existing drop structure.

Mr. Stridle told me there was a possibility that we would not need a permit for doing this type of work and advised me to get in touch with Mr. Douglas Meagley of the Soil Conservation Service.

I called Mr. Meagley, who in turn called Mr. Stridle and the Albany office. His information from Albany was that there are 3 categories to consider where a permit is necessary:

1. Raising the level of the lake
2. Increasing spillway overflow
3. Working on main part of dam

none of which we are planning.

Since he would not be able to inspect and give us advice in time to do any work this fall, he suggested we hire a private engineer to make sketches of the proposed work and mail them to you.

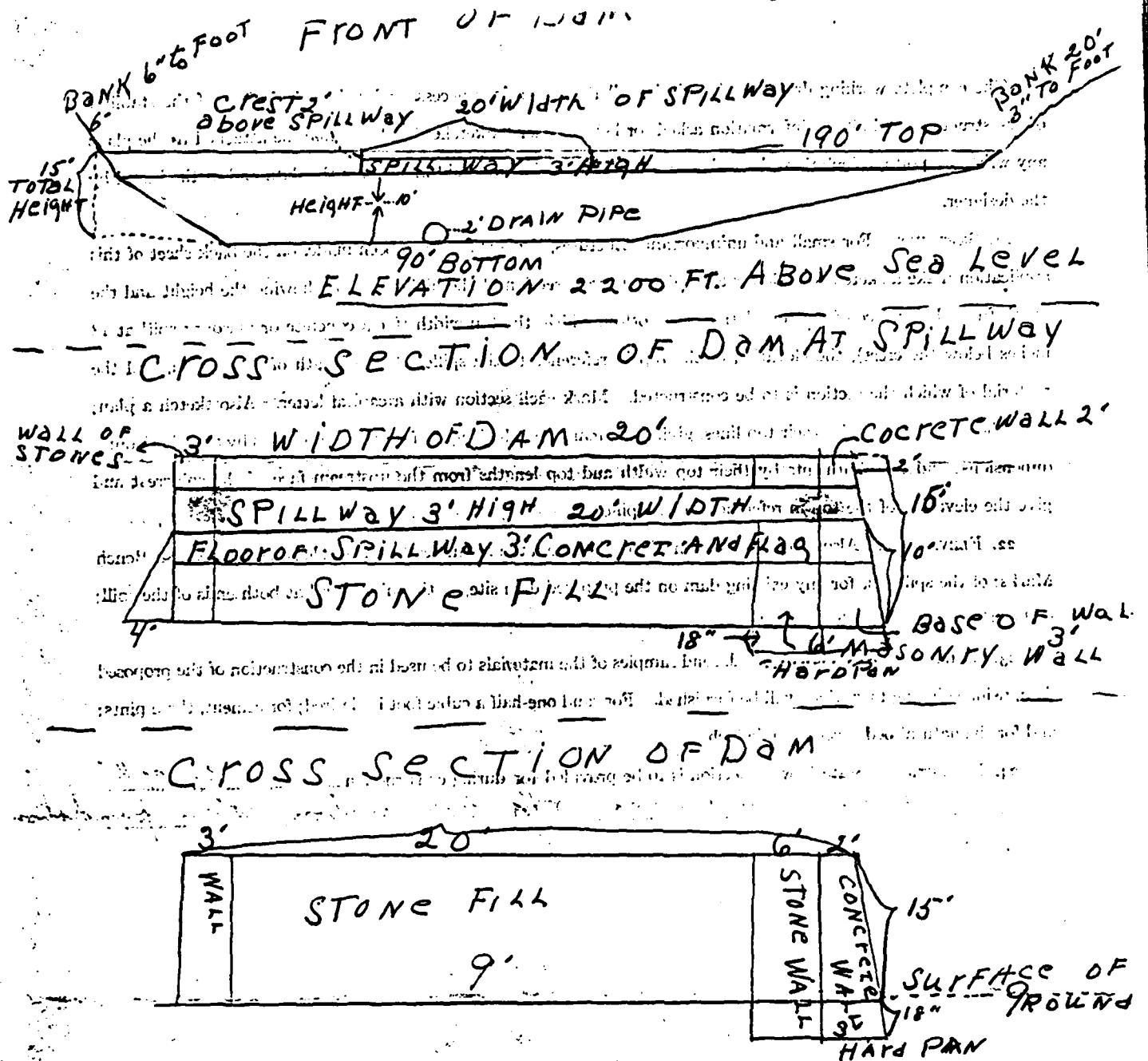
We have started lowering the lake and would like to do some of the rock fill this fall if possible, and then complete the work next fall.

Please advise us if we can do this work or if we need a permit.

Sincerely yours,

Lake Muskoday Bungalow Colony Inc.

Dorothy B. Graham, Sec.



The above information is correct to the best of my knowledge and belief.

T.P.D. Graham
(Address of signer)

Jan 21 1924
(Date)

I have been given power to sign for other owners.

(A person signing for Applicant should indicate his title or authority.)

Lake Muskoday
Roscoe, N. Y. 12776
Sept. 15, 1975

RECEIVED

Mr. George A. Danskin, Local Permit Agent
Dept. Environmental Conservation
21 S. Putt Corners Rd.
New Paltz, N. Y.

SEP 16 1975
RIDGEWOOD UNIT
New York State Department of
Environmental Conservation
REGION #3

Dear Mr. Danskin:

The Lake Muskoday Bungalow Colony Inc. wants to do some reinforcing work below our dam which is located on the headwaters of Trout Brook, Town of Fremont, Sullivan Co., about 2 miles below Tennannah Lake, and is listed as Dam 413 Delaware Watershed.

I called your office while you were on vacation and spoke to Mr. ~~William E. Stridle~~ explaining that we wanted to bring in rock fill to place below the dam for extra reinforcement and to make a rip-rap and stone masonry extension out from the existing spillway so the overflow will be a gradual flow instead of the existing drop structure.

Mr. Stridle told me there was a possibility that we would not need a permit for doing this type of work and advised me to get in touch with Mr. Douglas Meagley of the Soil Conservation Service.

I called Mr. Meagley, who in turn called Mr. Stridle and the Albany office. His information from Albany was that there are 3 categories to consider where a permit is necessary:

1. Raising the level of the lake
2. Increasing spillway overflow
3. Working on main part of dam

none of which we are planning.

Since he would not be able to inspect and give us advice in time to do any work this fall, he suggested we hire a private engineer to make sketches of the proposed work and mail them to you.

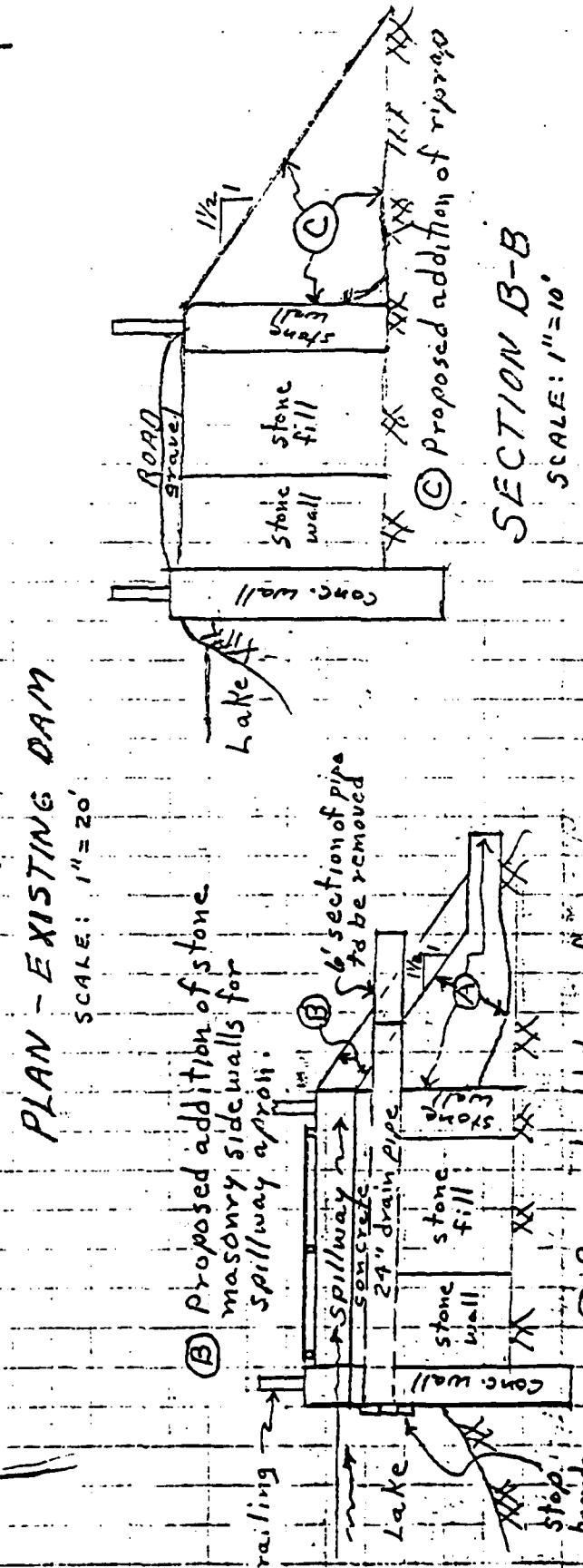
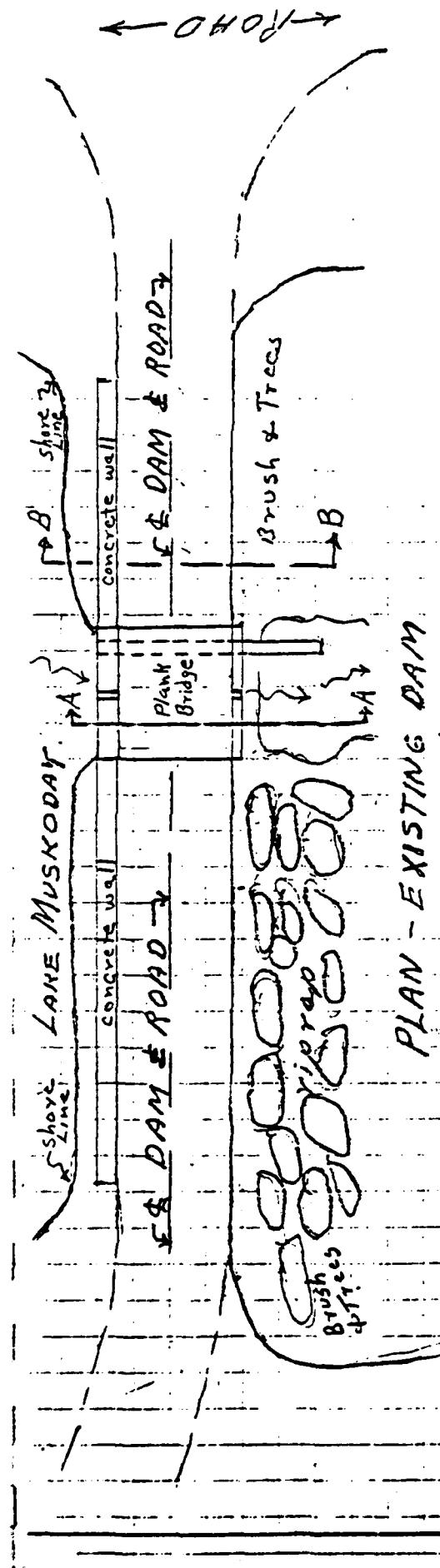
We have started lowering the lake and would like to do some of the rock fill this fall if possible, and then complete the work next fall.

Please advise us if we can do this work or if we need a permit.

Sincerely yours,

Lake Muskoday Bungalow Colony Inc.

Dorothy B. Graham, Sec.



SECTION B-B
SCALE: 1" = 10'

PROPOSED ADDITION OF RIPRAP AND STONE MASONRY TO THE LAKE MUSKODAY DAM

Prepared by Sheldon Hadden
P.E. # 0333312
Date 1 September 1955

SECTION A-A
SCALE: 1" = 10'

The riprap will be about 1/2 C. fd. in size.

PREVIOUS INSPECTION REPORTS

DEC DAM INSPECTION REPORT

Lake Muskoday

<input type="checkbox"/> 00	<input type="checkbox"/> 53	<input type="checkbox"/> 24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> 413	<input type="checkbox"/>	<input type="checkbox"/> 062073	<input type="checkbox"/> 002	<input type="checkbox"/> 2
RB	CTY	YR. AP.	DAM NO.			INS. DATE	USE	TYPE	

AS BUILT INSPECTION

- | | | |
|---|--------------------|--|
| <input checked="" type="checkbox"/> 3 Location of Spillway and outlet | Reconstructed | <input checked="" type="checkbox"/> 3 Elevations |
| <input checked="" type="checkbox"/> 3 Size of Spillway and outlet | Since construction | <input checked="" type="checkbox"/> 3 Geometry of Non-overflow section |

GENERAL CONDITION OF NON-OVERFLOW SECTION

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> 1 Settlement | <input checked="" type="checkbox"/> 1 Cracks | <input checked="" type="checkbox"/> 1 Deflections |
| <input checked="" type="checkbox"/> 1 Joints | <input checked="" type="checkbox"/> 2 Surface of Concrete | <input checked="" type="checkbox"/> 1 Leakage |
| <input checked="" type="checkbox"/> 1 Undermining | <input checked="" type="checkbox"/> 1 Settlement of Embankment | <input checked="" type="checkbox"/> 1 Crest of Dam |
| <input checked="" type="checkbox"/> 1 Downstream Slope | <input checked="" type="checkbox"/> 1 Upstream Slope | <input checked="" type="checkbox"/> 1 Toe of Slope |

GENERAL CONDITION OF SPILLWAY AND OUTLET WORKS

- | | | |
|--|--|--|
| <input checked="" type="checkbox"/> 1 Auxiliary Spillway | <input checked="" type="checkbox"/> 1 Service or Concrete Spillway | <input checked="" type="checkbox"/> 1 Stilling Basin |
| <input checked="" type="checkbox"/> 1 Joints | <input checked="" type="checkbox"/> 2 Surface of Concrete | <input checked="" type="checkbox"/> 1 Spillway Toe |
| <input checked="" type="checkbox"/> 2 Mechanical Equipment | <input checked="" type="checkbox"/> 1 Plunge Pool | <input checked="" type="checkbox"/> 1 Drain |

 Maintenance Hazard Class Evaluation InspectorCOMMENTS:

Concrete spillway with 2' drain pipe cmp.

Under access road good cond.

APPENDIX E
STRUCTURAL STABILITY ANALYSIS

(No STRUCTURAL STABILITY ANALYSIS was required for this dam)

APPENDIX F
REFERENCES

REFERENCES

1. Chow, Ven Te, Editor - Handbook of Applied Hydrology. McGraw-Hill Book Company, New York, New York, 1964.
2. Hydrologic Engineering Center, U.S. Army Corps of Engineers, HEC-1 Flood Hydrograph Package, Users Manual. Davis, California, January 1973.
3. Hydrologic Engineering Center, U.S. Army Corps of Engineers, Flood Hydrograph Package (HEC-1), Users Manual for Dam Safety Investigations, Davis, California, September 1978.
4. King, Horace and Brater, Ernest. Handbook of Hydraulics, 5th Edition. McGraw-Hill Book Company, New York, New York, 1963.
5. Riedel, J.T., Appleby, J.F. and Schloemer, R.W. Seasonal Variation of the Probable Maximum Precipitation East of the 105th Meridian for Areas from 10 to 1000 Square Miles and Durations of 6, 12, 24, and 48 Hours (Hydrometeorological Report No. 33) U.S. Department of Commerce - Weather Bureau and U.S. Department of the Army - Corps of Engineers, Washington, D.C., April 1956
6. U.S. Department of the Interior, Bureau of Reclamation, Design of Small Dams, Second Edition, Washington, D.C., 1973.

APPENDIX G

DRAWINGS

(No DRAWINGS were available for this dam)